DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

CONTROLLED DOCUMENT

DMA Docket No. 2880

DO NOT DETACH THIS SLIP

Action on this document is recorded and controlled in Reports and Records Branch. Any movement of this document between divisions or offices of DMA or movement outside DMA must be reported to the Reports and Records Branch. Actions taken that affect status of the case must also be reported. One copy to USGS. & USBM.

This document has been recorded as

EXPLORATION ASSISTANCE

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

Routing Slip

To:	Code 700, Room 4640	Date	2/11/53
To:	Open Com	Date	4-15-53
To:	Open Com	Date	8-7-53
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	
To:		Date	

DO NOT DETACH

CONTROLLED DOCUMENT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 12 1953

August 11, 1953

Memorandum

To: Ernest Wm. Ellis, Room 4640, DMEA

From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

Subject: Field team report on Docket DMEA 2880, Black Magic Placer Claims, Maricopa Co., Arizona.

This office concurs with the recommendations of denial made in the field team report and review by John H. Soule' and Walter R. Storms, respectively, on the above-named docket.

The report and a copy of this memorandum are being forwarded to the Minerals Division.

E. J. Carlson

E. J. Carlson

8/14/53

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 12 1953

August 11, 1953

Memorandum

To: Ernest Wm. Ellis, Room 4640, DMEA

From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

Subject: Field team report on Docket DMEA 2880, Black Magic Placer Claims, Maricopa Co., Arizona.

This office concurs with the recommendations of denial made in the field team report and review by John H. Soule' and Walter R. Storms, respectively, on the above-named docket.

The report and a copy of this memorandum are being forwarded to the Minerals Division.

Signed

E. J. Carlson

8-14-53

FILE COPY
SURNAME: 318

Docket.
Murphy
Carlson 8/7/53
Ellis
Higgins
Kimball
Selfridge
Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. Murry C. Papy, General Partner
Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

AUG 10 1953

Re: Docket No. DMEA-2880 (Monazite & Rare Earth Minerals)
Black Magic Placer Claim
Maricopa County, Arizona

Dear Mr. Papy:

Reference is made to your application for Government aid on the proposed captioned project estimated to cost $33,657.50.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding material of acceptable grade and in quantities that will significantly improve the mineral supply position for the National Defense Program.

A careful study of your application and data available to this Agency and an examination of the property concerned reveal that the probability of disclosing minable ore reserves by your proposed exploration program is not sufficiently promising to justify Government participation. Under these circumstances, we regret to advise that your application for exploration aid is denied.

Your interest in the exploration program of the Defense Minerals Exploration Administration and your willingness to participate therein are appreciated.

Sincerely yours,

C. O. Mittendorf (fw)

Administrator

8-10-53

FMMurphy/db
8-7-53
cc to: Adm. Reading File
Operating Committee
Docket
Messrs: E.J.Carelson, Rm. 3649
D.M.Larrabee, Rm. C-232, CBA
Ellis
Murphy
DMEA Field Team, Region IV (2)

8/6/53

Mr. Murphy

Please review Field Team report, comments of USGS (Larrabee) and surname denial letter. Also please review "Summary" I prepared. Then to Mr. Ellis.

Reviewed - concur with F.T. denial
Murphy

Mr. Ellis:

I have prepared the route slip for this letter to be surnamed by Mr. E. J. Carlson, USBM, before you surname the denial letter, if you agree with this arrangement. The denial letter was prepared on July 31 but held for his comments. I thought this way we can get it to the Operating Committee tomorrow. Summary will be typed before it goes down to Mr. Carlson.

gla

I have left space for Mr. Carlson's signature
AUE

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
AUGUST 7, 1953

SUMMARY OF PROPOSED PROJECT

Docket No. DMEA-2880
Applicant: Black Magic Mining Association
714 North Seventh Ave.,
Phoenix, Arizona
Subject: Denial of application

Commodity: Monazite and Rare Earths
Location of property: Maricopa County, Arizona Region IV

Amount of Application: $33,657.50
Date of application: January 29, 1953

Outline of project: The Black Magic group of placer claims is entirely undeveloped. Other than a few test and location pits, no other work has been done on the property, and no work is being done on the claims at the present time (June 1953). The proposed work was to have consisted of drilling 200 holes to an average depth of 20 feet. The drilling was to have been done with diamond core-drill type of equipment using Acker soil sampling tools.

Field Team Report: dated June 1953
by John H. Soule', Mining Engineer, USBM
John N. Faick, Geologist, USGS

Transmittal letter by Field Team, Region IV, dated July 16, 1953

Recommendations: The field examination revealed no indications that important amounts of monazite occur on the property. Denial recommended by field examiners, in which the Field Team concurs.

Commodity Members comments:

Bureau of Mines: No comments on Field Team report prepared. Denial letter surnamed by Mr. E. J. Carlson in lieu of comments.

Geological Survey: D. M. Larrabee, dated July 24, 1953.

Concurs in denial recommended by the Field Team.

Rare & Misc. Metals Division Engineer: F. M. Murphy

Comments: Denial letter prepared.

Ernest Wm. Ellis

Ernest Wm. Ellis, Chief
Rare & Misc. Metals Div.

7/29/53 glc

IN REPLY REFER TO:

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration G-MD-CNM
RECEIVED
JUL 24 1953

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

July 24, 1953

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2880 (monazite)

To: L. G. Houk, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant: Black Magic Mining Association.
Name of property: Black Magic claims.
Location of property: Maricopa County, Arizona.
Date of field team report: June 1953.
Authorship of field team report: John N. Faick and John H. Soule'.
Field team's recommendation: Denial.
Comments: I concur with Field Team.
ACTION SUGGESTED: Follow field team's recommendation.

D M Larrabee

D. M. Larrabee

IN REPLY REFER TO:

G-MD-CMM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

July 24, 1953

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2880 (monazite)

To: L. G. Houk, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant: Black Magic Mining Association.
Name of property: Black Magic claims.
Location of property: Maricopa County, Arizona.
Date of field team report: June 1953.
Authorship of field team report: John N. Faick and John H. Soule'.
Field team's recommendation: Denial.
Comments: I concur with Field Team.
ACTION SUGGESTED: Follow field team's recommendation.

D. M. Larrabee

Larrabee:jeh
7/24/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee G-232(files)

IN REPLY REFER TO:

G-MD-CDM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

July 24, 1953

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2880 (monazite)

To: L. G. Houk, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant: Black Magic Mining Association.
Name of property: Black Magic claims.
Location of property: Maricopa County, Arizona.
Date of field team report: June 1953.
Authorship of field team report: John N. Faick and John H. Soule'.
Field team's recommendation: Denial.
Comments: I concur with Field Team.
ACTION SUGGESTED: Follow field team's recommendation.

D. M. Larrabee

Larrabee:jeh
7/24/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee G-232(files)

7/27/53 gla

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

July 16, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2880 (Monazite and Rare Earths), Black Magic Placer claims, Maricopa County, Arizona.

Enclosed are the original and three copies of the report pertaining to the above application.

The field examination revealed no indications that important amounts of monazite occur on the property.

We recommend that the application be denied.

W. H. King
W. H. King
Field Team, Region IV

A. N. Koschmann
A. N. Koschmann
Field Team, Region IV

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

July 16, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2880 (Monazite and Rare Earths), Black Magic Placer claims, Maricopa County, Arizona.

Enclosed are eleven copies of the final engineering report on the subject docket.

The applicant requested $33,657.50 to delineate and sample the black sands on the group of placer claims.

The field examiners found no evidence that important amounts of monazite occur on the property and they recommend that the application be denied.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

MINING DIVISION
REGION IV

June 29, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2880, Black Magic Mining Association's Black Magic Placers, Bighorn Mountains, Maricopa County, Ariz. (Monazite and Uranium).

Enclosed are original and 10 copies of the section on Summary, Conclusions and Recommendations by John R. Soule' of the Bureau of Mines and John N. Faick of the Geological Survey, and the section on Engineering by Soule' for the above report. A separate report on the geology will be submitted by the Geological Survey.

As there seems little chance of discovering any significant amount of radioactive material by the proposed exploration work, the DMEA examiners recommend that a loan be denied. I concur with their recommendations.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC W. H. King (10)
R. F. Robinson
DMEA-2880
DF

WRStorms:frj

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
200 New Customhouse
Denver 2, Colorado

July 13, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2880, Black Magic Placer Claims, (Monazite and rare earths), Maricopa County, Arizona

Enclosed please find the original and 10 copies of the geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 4126, University Station
Tucson 5, Arizona

July 10, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: R. F. Robinson, Tucson, Arizona

Subject: Docket DMEA 2880, Black Magic Placer Claims, (Monazite and rare earths), Maricopa County, Arizona

Enclosed please find the original and 10 copies of the geologic report on the subject docket.

The applicant wished to conduct exploration of his placer deposit which he believed contained monazite. The samples taken by the examiners failed to contain monazite and the slight radioactivity present appears due to sphene and zircon which are in the gravels.

It is recommended that the loan be denied because there are no indications that important amounts of monazite occur on the property.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2880, Black Magic Mining Association, Black Magic Placers
Bighorn Mountains, Maricopa County, Arizona
(Monazite?, Uranium?)

John H. Soule', Mining Engineer
U. S. Bureau of Mines

John N. Faick, Geologist
U. S. Geological Survey

June 1953

Reviewed by
DMEA OPERATING COMMITTEE
7-24-53
(date)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By John H. Soule[1], and John N. Faick[2]

Radioactivity recently was discovered in black sands occurring in creek placers in the Bighorn Mountains, Maricopa County, Ariz. The Black Magic Mining Association located a group of placer claims consisting of 32 claims of 160 acres each. This association, a partnership, applied for Government assistance from the Defense Minerals Exploration Administration to explore the claims. This application, Docket DMEA-2880, was sent to the field for an examination of the property. Exploration by drilling to cost an estimated $33,657.50 was proposed by the applicant.

The Black Magic placer claims are situated in one of the most arid areas of the Nation. Summers are very hot but the winters usually are mild. Precipitation is scanty and no permanent streams exist in the area. Probably no large quantity of subsurface water could be developed near the claims. The area is somewhat isolated. There is no nearby source of equipment, supplies and labor. Living accommodations are limited.

Two general types of placer gravels occur in the area. The older bank gravels show little sorting and contain large rock fragments, mostly from volcanic rocks with some from the granite basement rock. The more recent gravels are more sandy in texture and largely are the older gravels that have been reworked by stream action. These later

---

1/ Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

gravels are not as extensive as the older ones. Both types of gravels are poorly consolidated. Bedrock outcrops at a number of places in the area.

The black sand concentrates from the gravels contain a small amount of radioactivity. The applicant sampled some of the creek gravels and submitted the concentrates obtained from them to the Ding's Magnetic Separator Co. who parted the concentrates into 13 fractions. These fractions were submitted to the Lindsey Chemical Co. who determined the monazite content of each fraction. It seems that monazite was not verified by microscopic nor chemical tests. The gravels contained less than 0.1 percent of monazite based upon the above data.

One sample from a nearby area was reported by the Atomic Energy Commission to contain a small amount of thorite. No monazite nor thorite was noted, microscopically or chemically, in the samples taken by the DMEA examiners and submitted to the Metallurgical Division of the Bureau of Mines. The small amount of radioactivity, 0.009 to 0.01 percent U_3O_8 equivalent in the best sample, was determined to have been derived from radioactive sphene and altered zircon.

Although there is a considerable quantity of gravels on the Black Magic placer claims, the content of radioactive minerals is negligible and a significant discovery is highly improbable. Sufficient water to sustain a placer operation of any size probably could not be developed near the area.

Because of the insignificant amounts of radioactive material in the Black Magic placers and the lack of water to sustain a placer operation, it is recommended that the application for Government assistance to explore the Black Magic group of claims, Docket DMEA-2880, be denied.

BLACK MAGIC PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(MONAZITE AND RARE EARTHS)
MURRY G. ESPY, APPLICANT
DMEA 2880

Geologic Report

By
John N. Faick
Geologist, U. S. Geological Survey

BLACK MAGIC PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(Monazite and Rare Earths)

DMEA 2880

By
John N. Faick
Geologist, U. S. Geological Survey

CONTENTS

	Page
INTRODUCTION	1
GENERAL GEOLOGY	1
DESCRIPTION OF THE PLACER DEPOSITS	2
SAMPLES AND GRADE	5
ORE RESERVES	8
POSSIBLE EXPLORATION	8
CONCLUSIONS	9
RECOMMENDATIONS	9

ILLUSTRATIONS

Figure 1	Location Map	See Engineering Report
Figure 2	Claim Map	" " "
Figure 3	Sketch Map - Black Magic Placer Claims	To Follow Page 2

INTRODUCTION

The Black Magic Placer Claims, consisting of 32 unpatented placer claims of 120 acres each on approximately 3840 acres, was examined May 18-19, 1953. The claims were examined by J. H. Soulé, Engineer, U. S. Bureau of Mines, and J. N. Faick, Geologist, U. S. Geological Survey for the Defense Minerals Exploration Administration, which is in receipt of an application for Government assistance in exploring the property for monazite and rare earth minerals, some of which are radioactive.

The property was shown to the field examiners by Murry G. Espy, 714 N. 7th Avenue, Phoenix, Arizona, who is the principal owner and manager of the group of claims.

GENERAL GEOLOGY

The Black Magic Placer Claims are situated in T. 4 N., R. 9 W. in the southwestern part of the Bighorn Mountains, and are about 25 miles northwest of Buckeye, Arizona. The Bighorn Mountains consist of a roughly eroded mass of intrusive and extrusive igneous rocks which rise several hundred feet above the Harquahala plain, a broad detrital filled valley now occupied by Centenial Wash, which lies a few miles southwest of the mountains.

The climate is arid with a rainfall of only a few inches a year, consequently living and working conditions are

rendered unfavorable by the lack of water and by the intense heat of summer. There are no permanent streams in the area, but the mountains are drained by numerous arroyos which flow southwestward to the plains after heavy rains. In some of the larger arroyos in the mountains, water may be obtained in small amounts from shallow alluvium. Near the base of the mountains, the applicant has a well from which domestic supplies of water are obtained at a depth of 460 feet. In the Harquahala plain, at a distance of from 5 to 10 miles southwest of the Black Magic claims, ground water is now being pumped in sufficient quantity to irrigate a few thousand acres of farm land.

The part of the Bighorn Mountains in which the Black Magic placer claims are situated is composed of gray coarse grained, nearly equigranular granite of probable pre-Cambrian age, and of Tertiary volcanics, which are several hundred feet thick, and which consist mostly of andesites, rhyolites and agglomerates. The volcanics rest upon an erosion surface developed upon the granite, and the erosion surface has a relatively low relief which probably does not exceed 100 feet in the area occupied by the Black Magic claims.

DESCRIPTION OF THE PLACER DEPOSITS

Part of T. 4 N., R. 9 W. is drained by a large arroyo and its numerous tributaries (See Fig. 3), which have removed

the volcanics from large areas and have eroded shallow channels into the underlying pre-Cambrian granite. Most of the volcanics have been removed and the underlying granite exposed in a basin-like area about 3 miles wide and about 5 miles long. Most of the floor of this basin-like area is covered with gravel and sand except in a few small scattered areas where granite or volcanic rocks crop out. The depth of the alluvium is unknown, but the fact that granite and volcanics crop out in several places in the floor of the basin or along the course of the arroyo indicates that the gravel is not deep. This writer believes that the post-Tertiary erosion has cut only slightly into the pre-Cambrian granite and that the present topography is influenced to a moderate extent by the character of the pre-Tertiary erosion surface.

The alluvial deposits are of two relatively different ages and both of these are composed of sand and gravel derived from the pre-Cambrian granite and from Tertiary volcanics. Both the older and younger alluvium contain small amounts of "heavy" minerals, but the greatest concentration is in the sands and gravels of the present stream channels.

The older alluvium is composed of boulders ranging from about 2 inches to about 10 inches in diameter, and contain a high proportion of sand and gravel. The material is slightly

consolidated, and in places it is firmly cemented by caliche. This older alluvium apparently covered the basement rocks to a depth of many tens of feet, and the younger drainage channels have developed by erosion of it.

The alluvium in the younger channels consists of loose unconsolidated sands and small-sized gravels along the bottom of the recent drainage channels. These channels are very irregular and sinuous and range in width from about 25 feet to about 150 feet and have cut into the older valley fill to depths of from 5 to 15 feet. Most of the alluvial material in these recently formed deposits is derived by reworking at the older fill, although a small part of it may have been derived by recent erosion of the presently exposed surfaces of granite and volcanics.

The heavy minerals, some of which are slightly radioactive, consist principally of magnetite with which are associated other heavy minerals. These heavy minerals are concentrated as black sands in very thin layers or coatings on the surfaces of the present stream sands and also form thin bands or layers, seldom over an inch thick, that are interbedded with the unconsolidated sands in the floor of the arroyo. The presence of heavy sands is usually indicated by magnetite.

The deposits have been prospected by several test pits, which range from a few inches to about 5 feet deep.

These reveal the existence of thin beds and disseminated particles of black sand throughout the zone prospected by the pits, but none of the work done to date has penetrated deep enough to determine if greater concentrations of black sand are to be found on bedrock. The wide distribution of the heavy sand, and the slightly disseminated nature of it, indicates that there has probably been but little natural concentration of the heavy minerals.

The source of the heavy sands undoubtedly is the pre-Cambrian granite because several small arroyos draining areas of exposed granite contain black sand, whereas arroyos draining areas of volcanics apparently do not contain the heavy sands. None of the heavy minerals are visible in the granite, however, they are undoubtedly present as minor or accessory minerals.

SAMPLES AND GRADE

Four samples (See Fig. 3 for location) were taken by the applicant and concentrated by him by panning. In the samples the heavy minerals were found by panning to constitute from 2 to 16 precent of the alluvium and averaged about 9 percent.

The concentrates obtained by panning were submitted by the applicant to Ding's Magnetic Separator Company which separated 6800 grams of the concentrate into 13 fractions

dependent upon magnetic susceptibility. The concentrate fractions were then submitted to the Lindsey Chemical Company which reported the presence of monazite. The identification of monazite is questioned because none was found by the careful mineralogical and chemical tests made for D.M.E.A.

The combined results of analysis made by the Ding's Magnetic Separator Company and Lindsey Chemical Company on the panned concentrate submitted by the applicant is summarized in the following table. In this table the indicated percentage of monazite in the gravels was calculated by J. H. Soulé.

Fractions of sample	Weight in grams	Percent of sample	Grams of monazite in fraction	Percent of monazite in fraction	Percent monazite in gravels
A	4900	72.1	None	None	None
B-F	1134	16.6	11.34	1.0	0.0150
G-M	766	11.3	62.25	8.00	0.0824

It can be seen from the above table that 72 percent of the concentrates contained no monazite. All of the monazite is contained in the remaining 28 percent of the sample, represented as fractions B-F and G-M in the above table. These samples indicate that the original gravels contained less than 0.1 percent monazite, or other minerals reported as monazite.

During this examination 6 samples (Location of 1, 2 and 5 are shown on Fig. 3) were taken and were submitted to the Metallurgical Division of the U. S. Bureau of Mines at

Tucson, Arizona, for analysis. These samples are described as follows:

Field No.	U.S.B.M. No.	Description
1	3439	5.0-foot sample from east test pit
2	3440	5.0-foot sample from west test pit
3	3441	General sample from 5 miles of creek bed
4	3442	General sample of selected black sand from 5 miles of creek bed
5	3443	4.0-foot channel from gravel banks next to creek
6	3444	Cuttings from old churn drill hole

The minerals identified in the heavy mineral concentrates are magnetite, hematite, sphene, hornblende, biotite, garnet, ilmenite, and zircon. Monazite and thorite minerals were not found in the samples taken by D.M.E.A. Microscopic observations were substantiated by chemical analysis which yielded less than 0.1 percent combined rare earth minerals.

The investigation revealed that most of the radioactivity in the placer sands was associated with the sphene and altered zircon. The equivalent percent of U_3O_8 ranges from zero to a maximum of 0.12 percent. The radioactivity is restricted to a non-magnetic portion having a specific gravity greater than 2.8, and this radioactive fraction constitutes only about 4 percent of the sample tested. These samples indicate that the gravels sampled contain U_3O_8 equivalent ranging from

about 0.005 percent to about 0.01 percent. These samples were taken at widely separated localities but are undoubtedly representative of the material available.

ORE RESERVES

Although many millions of yards of gravel are present within the boundaries of the Black Magic placer claims no effort was made to calculate the tonnage because examination of the deposits failed to reveal the existence of significant amounts of radioactive minerals or rare earths. At no place are the radioactive minerals concentrated in mineable quantities.

POSSIBLE EXPLORATION

The applicant proposed to explore the Black Magic placer claims at a total cost of $33,657.50. The proposed method of exploration was to drill the deposit with a diamond drill machine equipped with an Acker soil auger. It was proposed to drill 200 holes having an average depth of 20 feet.

Examination reveals that the material is not sufficiently consolidated to permit sampling with a small diameter auger-drilled hole. It could only be satisfactorily sampled with cased holes or test shafts. Possible methods of exploration were not suggested to the applicant because there was no apparent justification for exploring the deposit.

CONCLUSIONS

Examination of the Black Magic placer claims and data obtained from the Metallurgical Division of the U. S. Bureau of Mines on samples taken by the D.M.E.A. examiners result in the following conclusions:

1. Two radioactive minerals, sphene and altered zircon, were obtained from the placer deposits. Thorite was reported from a nearby area by the A.E.C. Monazite was reported by the Lindsey Chemical Company but was not found in the samples taken by D.M.E.A.

2. Samples taken by the applicant indicate that the monazite (?) content of the gravel is less than 0.1 percent. Samples taken by the D.M.E.A. examiners contained less than 0.01 percent U_3O_8 equivalent.

3. The amount of radioactive and rare earth minerals is so small in the deposit that it does not contain a significant reserve of these minerals.

4. These deposits occur in an extremely arid area where there is not sufficient water to permit normal placer operations.

RECOMMENDATIONS

It is concluded that the Black Magic placer deposits do not contain significant amounts of radioactive or rare earth

minerals, therefore it is recommended that the application for Government assistance be denied.

DMEA-2880, Black Magic Mining Association, Black Magic Placers
Bighorn Mountains, Maricopa County, Arizona
(Monazite?, Uranium?)

Engineering Report

By John H. Soule, Mining Engineer
U. S. Bureau of Mines

June 1953

DMEA-2880 - BLACK MAGIC MINING ASSOCIATION, BLACK MAGIC PLACERS
BIGHORN MOUNTAINS, MARICOPA COUNTY, ARIZONA
(MONAZITE?, URANIUM?)

CONTENTS

Engineering report	Page
Introduction	1
Acknowledgments	1
Location, topograph and physical features	1
History and production	3
Ownership and extent	4
Description of the deposits	4
Minable ore reserves	5
Present status	12
Proposed project and costs	12
Conclusions	13
Recommendations	14

TABLES

Number		Page
I	Concentration Ratio	6
II	Results from applicant's samples	6
1	(Metallurgical) Fractionation of Black Sands from Bureau of Mines samples	10

ILLUSTRATIONS

Figure		Following page
1	Location map	2
2	Claim map	4

INTRODUCTION

Radioactive material recently was discovered in the black sands in certain placer areas in the Bighorn Mountains in western Maricopa County, Ariz. Many placer claims were located and the locators of one group, the Black Magic Mining Association, applied to the Defense Minerals Exploration Administration for Government assistance to explore the claims. The application, Docket DMEA-2880, was sent to the field for an examination of the property. This examination was made on May 19, 1953 by the DMEA Field Team consisting of John N. Faick of the United States Geological Survey and John H. Soule' of the United States Bureau of Mines

ACKNOWLEDGMENTS

Acknowledgment is due Murry G. Espy, one of the principal partners of the Black Magic Mining Association, for showing the examining team over the Black Magic group of claims and for furnishing data pertaining to the property. Acknowledgment also is due the Metallurgical Division of the Bureau of Mines in Tucson for the work it did on samples submitted to it.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Black Magic placer claims are situated in the lower half of T. 4 N., R. 9 W., in the northwestern part of Maricopa County, Ariz. The property is reached by travelling west from Buckeye, Ariz. on U. S. Highway 80 for 9.5 miles to Hassayampa, Ariz. Turn right or northwesterly off U. S. HIghway 80 at the western edge of Hassayampa

and follow the "Parker Cutoff" road towards Salome, Ariz. for 31.1 miles, thence off this road to the right, or northerly following a poor road for 2.3 miles. Take the right fork and continue northerly for 1.2 miles to the Espy homestead. From the homestead, travel westerly for about one mile, thence northerly for an additional 5 miles to a large dry wash. This wash courses easterly towards its head through the important part of the property. This wash to the east, and its tributaries for a distance of about 5 miles contain the gravels that have concentrations of the slightly radioactive black sands. The route from Buckeye to the property is shown in figure 1. Travel up the dry washes containing the placers is improbable in motor vehicles without four-wheel drive.

The topography is typical basin and range. The Bighorn mountains near the area are rugged and reach an altitude of approximately 3,000 feet. The placer deposits are situated in a small basin in the western part of the mountains and largely are flanked by low foothills. The deposits are at an approximate altitude of 1,650 feet.

The area is typical desert and is in one of the most arid parts of the state. Summer temperatures are very hot but the winters usually are mild. Freezing weather is rare. Precipitation is scanty, probably averaging less than 10 inches per year. Most of the precipitation occurs as heavy thunder showers in the summer which tend to obliterate the little travelled back roads. There are no permanent streams in the area, but small amounts of water occur in nearby wells at depths reported to be only a few hundred feet below the surface. Considerable

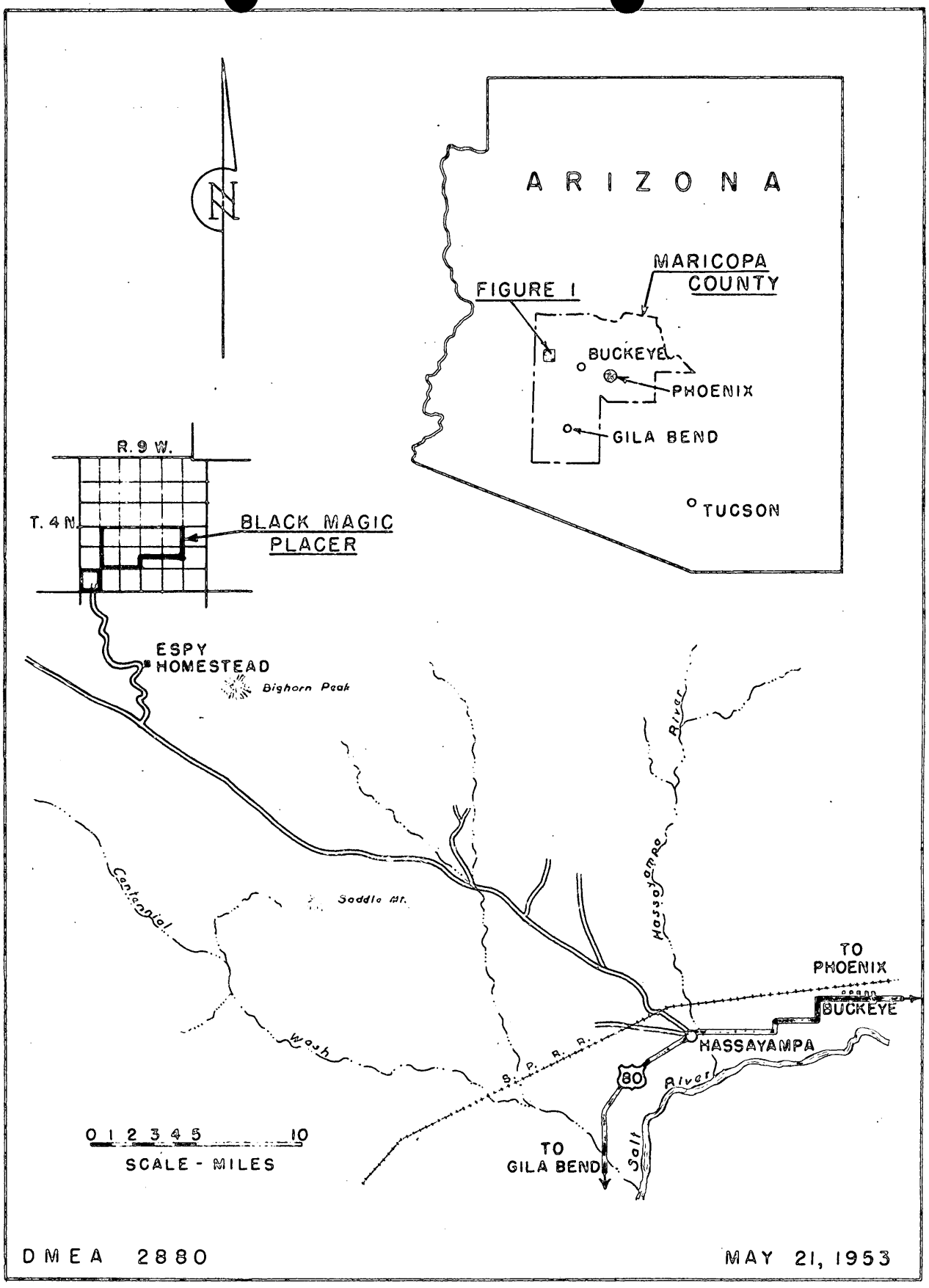


FIGURE 1. - LOCATION MAP - BLACK MAGIC PLACER
MARICOPA COUNTY, ARIZONA

water for irrigation purposes is being developed in the Centennial Wash, about 10 miles south of the placer deposits. It is probable that no large amount of subsurface water could be developed any nearer the Black Magic claims because of their proximity to the mountains.

Ironwood, palo verde, and mesquite trees dominate the landscape near the washes and creeks. Greasewood and cholla abound with other varieties of shrubs and cactus present. None of the trees would furnish timber suitable for mining purposes.

There are no living accommodations near the deposits other than 2 houses on the Espy homestead. Services and supplies are nonexistent and Phoenix, Ariz., about 80 miles by road to the east, would be the source of major mining supplies and equipment. Minor supplies are obtainable at Buckeye, about 56 miles by road to the southeast, at Salome, Ariz., about 40 miles by road to the northwest, and at Aguila, Ariz., about 25 miles by road to the north. Aguila on the Santa Fe railroad is the nearest rail point, but Dixie siding on the Southern Pacific railroad, nearly 40 miles to the southeast, possibly is the most accessible.

HISTORY AND PRODUCTION

The presence of radioactive material in black sands obtained from placers near the Bighorn Mountains was a relatively recent discovery. A number of claims were located as the E. N. Greenleaf group. Further prospecting revealed radioactivity in black sands from placers to the north. Thirty-two placer claims of 160 acres each were located

on this later discovery. This group of claims is called the Black Magic group and was located by the Black Magic Mining Association of Phoenix, Ariz. This claim group is shown in figure 2. There has been no production of radioactive material from any placers in the area.

OWNERSHIP AND EXTENT

The Black Magic group of placer claims consists of 32 claims of 160 acres each as shown in figure 2. This group was located by the Black Magic Mining Association, a partnership composed of the following members: Murry G. Espy and John L. Holt, general partners, and Viola W. Holt, Ruby B. Espy, Lucille Woodward, C. L. Espy, Jr., Archie Babb, and Ernest C. Kneale, limited partners. The address of the association is 714 North 7th Avenue, Phoenix, Ariz. None of the claims are patented and all are of recent location.

DESCRIPTION OF THE DEPOSITS

The oldest rock in the area of the Black Magic placer deposits is a coarsely crystalline, slightly porphyritic granite of pre-Cambrian age. This is overlain in places by a series of Tertiary volcanics of varying texture and composition. Tuffs and obsidians were noted, as well as flows of more basic character. Recent basalts were seen in the general area, but none were noted near the placers.

There are 2 general types of placer deposits in the area. The older consists of poorly classified gravels containing rock fragments as large as 10 inches in diameter, Most of the rock fragments were derived from the Tertiary volcanics (about 90 percent), and the

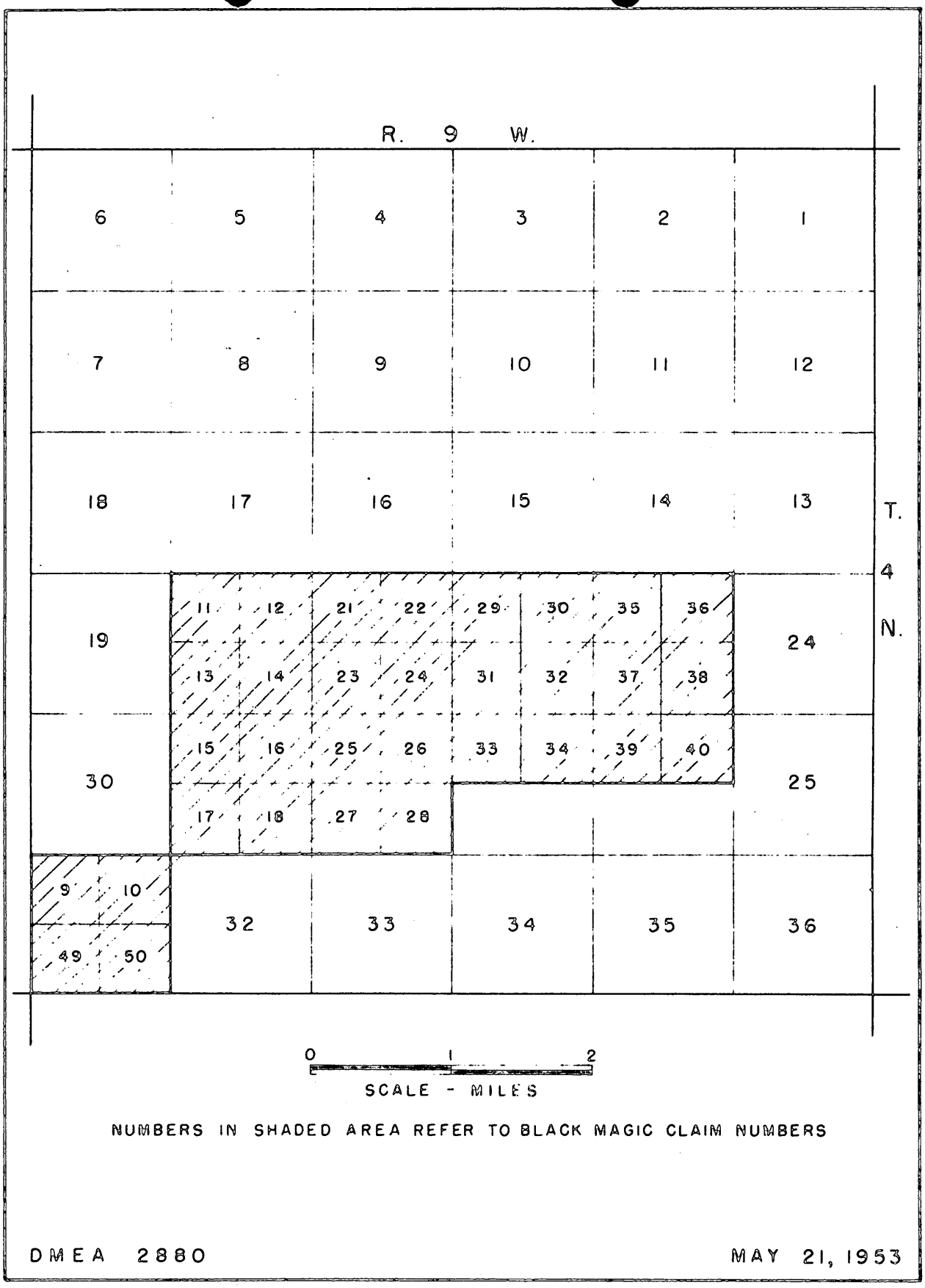


FIGURE 2. - CLAIM MAP - BLACK MAGIC PLACER

remaining fragments were of granite. No concentrations of black sands were noted in these gravels although some sand was present (approximately 3 percent). The black sands were disseminated throughout the gravels and were not concentrated in any one place.

The second type of placer consists of more recent creek gravels, in all probability derived from the older gravels reworked by stream action. The recent gravels are sandy testured with but few large rock fragments. Concentrations of black sands are common but not extensive. These creek gravels contain approximately 11 percent of black sands. Both types of gravels are poorly consolidated. Test pits in the recent gravels show that the walls are firm enough to stand for short periods of time. Flash floods usually obliterate the pits.

MINABLE ORE RESERVES

Large reserves of placer gravels can be indicated and inferred on the Black Magic claims. Four test pits reportedly were sampled by the applicant and 2 of the pits reportedly sampled were resampled by the engineer of the Bureau of Mines. In addition, the engineer took 2 general samples along 5 miles of the main creek, one of the black sand concentrations, and the other thought to be more representative of the creek gravels. One sample was taken of the older and coarser bank gravels. One sample of well drill-cuttings from near the area was submitted by the applicant.

The samples reportedly taken by the applicant were panned by Espy and the concentrates obtained were combined for further treatment. His reported ratio of concentrates to gravels is shown in the following table:

TABLE I. Concentration ratio of the applicant's samples.

Pit No.	Black sand concentrates percent
AX	2.25
BX	10.00
CX	8.00
DX	16.00
Arithmetic average	9.06

The combined concentrates obtained from the above samples reportedly were submitted to the Ding's Magnetic Separator Co. which separated the concentrates into 13 fractions depending upon their magnetic susceptibility. These fractions then were sent to the Lindsey Chemical Co. which determined the monazite content of the different fractions. The results were reported as percent of monazite in the fractions but it is not known whether the presence of monazite was verified by chemical or microscopic methods. One sample from a nearby area was submitted to the Atomic Energy Commission who reported a small amount of thorite in the sample.

The combined results of the work done on the applicant's samples and their reduction to the grade of the gravels from the data of Table I is shown in the following Table II:

TABLE II. Results obtained from the applicant's samples.

Sample fraction	Weight, grams	Percent of whole	Monazite in Concentrates Percent	Monazite in Concentrates Grams	Monazite in gravels, pct.
A	4,900	72.1	None	None	None
Total A	4,900			None	None
B	471	6.9	-1.0	-4.71	-0.0062
C	368	5.4	-1.0	-3.68	-0.0049
D	128	1.9	-1.0	-1.28	-0.0017
E	64	0.9	-1.0	-0.64	-0.0008
F	103	1.5	-1.0	-1.03	-0.0014
Total B-F	1,134	16.6		-11.34	-0.0150

TABLE II. Continued.

Sample fraction	Weight grams	Percent of whole	Monazite in Concentrates Percent	Monazite in Concentrates Grams	Monazite in gravels, pct.
G	38	0.6	5.0	1.90	0.0025
H	17	0.2	10.0	1.70	0.0028
I	25	0.4	20.0	5.00	0.0066
J	65	1.0	20.0	13.00	0.0172
K	42	0.6	20.0	8.40	0.0111
L	22	0.3	20.0	4.40	0.0058
M	557	8.2	-5.0	-27.85	-0.0369
Total G-M	766	11.3		-62.25	-0.0824
Total B-M	1,900	27.9		-73.59	-0.0974
Total A-M	6,800	100.0		-73.59	-0.0974

It can be seen from the above table that the bulk of the concentrates, 72 percent, contained no monazite. This material largely is magnetite. The remaining 28 percent of the concentrates contained all of the reported monazite which converts to less than 0.1 percent of monazite per ton of gravel. No work was done on the concentrates to determine whether or not an acceptable grade of monazite concentrate could be obtained.

Five samples were taken by the Bureau of Mines engineer and submitted, with one sample taken by the applicant, to the Metallurgical Division of the Bureau of Mines at Tucson, Ariz.

The results obtained by the Metallurgical Division is reported as follows:

"REPORT OF MICROSCOPIC EXAMINATION OF SIX PLACER SAND SAMPLES FROM THE BLACK MAGIC PLACER CLAIMS, MARICOPA COUNTY, ARIZONA

By: LaMar G. Evans

Introduction

"Six samples from the Black Magic Placer Claims, Maricopa County, Arizona (DMEA Docket No. 2880) were submitted by J.H.Soule' for examination to determine the monazite and thorite content. Fractionation tests also were made to determine the relative amounts of radioactive minerals.

"Source of the Samples

"The sample location of each of the sands is as follows:

Sample No.	
3439	5.0-foot channel from test pit east
3440	5.0-foot channel from test pit west
3441	General creek sample from 5 miles of creek
3442	Selected Black Sands, general sample from 5 miles of creek.
3443	4.0-foot channel from gravel banks next to creek
3444	Cuttings from old churn drill hole

"Description of Samples

"The sample as received were substantially finer than 4 mesh except for a few pebbles that graded in size up to about 1-1/2 inches. Representative head samples of each of the sands were screened into three products, a plus 6-mesh, minus 6 plus 100-mesh and minus 100-mesh. Radiometric and visual observations of the plus 6-mesh and the minus 100-mesh fractions showed that they did not contain any appreciable radioactivity.

"The minus 6 plus 100-mesh fraction which was the predominant grain size in the sands was magnetically separated to remove the magnetite. The non-magnetic portion was further fractionated with heavy liquids at a specific gravity of 2.8 to recover the heavy minerals which exhibited virtually all of the radioactivity. Results of the fractionation tests on each of the samples are given in table 1.

"Microscopic examination of the heavy mineral concentrates of the minus 6 plus 100-mesh fractions of the different sands revealed that samples Nos. 3439, 3440, 3441 and 3442 were very similar in mineral composition. The minerals identified were magnetite which has been partly altered to hematite, hematite, sphene and minor amounts of hornblende, biotite, garnet, ilmenite, zircon and altered zircon. The heavy mineral concentrates of samples 3443 and 3444 were composed chiefly of biotite and minor amounts of altered magnetite, hematite, sphene, ilmenite, chlorite, garnet and zircon, (sink at 2.8 sp. gr.).

"Although the placer sands were reported to contain appreciable monazite and thorite these minerals were not found. These microscopic observations were further substantiated by chemical analysis for combined rare earths on the minus 6 plus 100-mesh heavy mineral concentrate. The chemical analysis gave less than 0.01 percent combined rare earths.

"During the course of the investigation it was found that most of the radioactivity in the placer sands was associated with the sphene and altered zircon which reported in the heavy mineral concentrates. The equivalent percent U_3O_8 in each of the heavy mineral fractions of the different samples is given in table 1.

"Conclusions

"Microscopic examinations and confirmatory chemical analyses of the six placer sands submitted for identification revealed that they do not contain any significant amounts of monazite or thorite. Most of the radioactivity in these placer sands is due to uranium-bearing sphene and zircon.

TABLE 1. Fractionation of Black Sands From the Black Magic Placer Claims, Maricopa County, Ariz.

Sample No	Product	Weight, grams	Weight, percent	Equivalent Percent U_3O_8	Chemical Percent U_3O_8
3439	+6 Mesh	196	15.8	Nil	-
	-6 + 100 mesh (magnetic)	168	13.5	Nil	-
	-6 + 100 mesh (sink 2.8 sp. gr.)	32	2.6	0.06	-
	-6 + 100 mesh (float 2.8 sp. gr.)	832	66.9	Trace	-
	minus 100 mesh	15	1.2	Trace	-
	Composite Head	1243	100.0		
3440	+6 mesh	429.6	27.4	Trace	-
	-6 + 100 mesh (magnetic)	94.2	6.0	Nil	-
	-6 + 100 mesh (sink 2.8 sp. gr.)	30.2	1.9	0.04	-
	-6 + 100 mesh (float 2.8 sp. gr.)	998.5	63.6	Nil	-
	-100 mesh	16.5	1.1	Trace	-
	Composite Head	1569.0	100.0		
3441	-6 mesh	384.8	25.7	Trace	-
	-6 + 100 mesh (magnetic)	105.9	7.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	36.7	2.4	0.04	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	938.3	62.6	Nil	-
	-100 mesh	34.4	2.3	Trace	-
	Composite Head	1500.1	100.0		

Table 1. Fractionation of Black Sands from the Black Magic Placer Claims, Maricopa County, Ariz. (Con't.)

Sample No.	Product	Weight, grams	Weight, percent	Equivalent Percent U_3O_8	Chemical Percent U_3O_8
3442	+6 mesh	79.3	7.0	Nil	-
	-6 + 100 mesh (magnetic)	439.0	39.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	85.0	7.5	0.12	.045
	-6 + 100 mesh (float at 2.8 sp. gr.)	496.0	44.0	Nil	-
	-100 mesh	28.0	2.5	Trace	-
	Composite Head	1127.3	100.0	0.009	-
	Determined Head				.01
3443	+6 mesh	920	24.6	Nil	-
	-6 + 100 mesh (magnetic)	30	.8	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	85	2.3	0.02	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	2016	53.8	Nil	-
	-100 mesh	693	18.5	Trace	-
	Composite Head	3744	100.0		
3444	+6 Mesh	28.0	4.8	Nil	-
	-6 + 100 mesh (magnetic)	5.9	1.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	26.1	4.5	0.1	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	335.9	57.5	Nil	-
	-100 Mesh	188.2	32.2	Trace	-
	Composite Head	584.1	100.0		

Sample Nos. 3439, 3440, and 3441 are considered representative of the upper portions of the creek gravels and contained less than 0.0011 percent U_3O_8 equivalent; Sample No. 3442 was a special sample of the black sand concentrations representative only of such. This sample contained 0.009 percent U_3O_8 equivalent. This was verified by chemical analysis which converted to 0.01 percent U_3O_8. Sample No. 3443 may be considered representative of the upper part bank gravels and contained less than 0.0005 percent U_3O_8 equivalent. Sample No. 3444 of the well drill-cuttings contained less than 0.005 percent U_3O_8 equivalent. In discussing the representativeness of the samples, it is admitted that they are far spaced but are felt sufficiently representative for the purpose of this report.

Although the quantity of bank and creek gravels may be measured in the millions of cubic yards, it is evident from Table III that no ore reserves can be calculated for the Black Magic placers. From these results, it must be concluded that a significant discovery is not probable.

PRESENT STATUS

The Black Magic group of placer claims is entirely undeveloped, Other than a few test and location pits, no other work has been done on the property. No work is being done on the claims at the present time.

PROJECT PROPOSALS AND COSTS

The Black Magic Mining Association, the applicant for Government assistance to explore the placer claims, proposed a project to cost an estimated $33,657.50. The proposed work was to have consisted of drilling

200 holes to an average depth of 20 feet. The drilling was to have been done with diamond core drill type of equipment using Acker soil sampling tools.

A study of the placers revealed that they are too loosely consolidated to permit the taking of satisfactory samples by ordinary drilling methods. If the drilling is used, the hole must be cased and the gravel within the casing carefully removed. This would cost more than estimated by the applicant. Three types of sampling augers were tried by the engineer of the Bureau of Mines with unsatisfactory results because of the loose character of the gravels. Perhaps testpitting would be the best method of obtaining representative samples as shown by the pits on the property. The depth to which test-pitting could be done might be limited by safety considerations.

CONCLUSIONS

The following conclusions were derived from an examination of the Black Magic placer claims, from information supplied by the applicant, and from work done by the Metallurgical Division of the Bureau of Mines on samples taken by the Bureau of Mines engineer.

(1) The black sand concentrates of the placers contain a small amount of radioactivity. The radioactive mineral was determined to be radioactive sphene and altered zircon. No significant quantities of thorite or monazite occurred in the samples taken by the Bureau of Mines engineer.

(2) The monazite(?) content of the samples taken by the applicant was less than 0.1 percent in the gravels. The radioactive sphene and altered zircon in the Bureau of Mines samples constituted less than

0.01 percent U_3O_8 equivalent in the best sample. More representative samples contained 0.0011 and 0.00046 percent U_3O_8 equivalent as radioactive sphene and altered zircon in the creek and bank gravels respectively.

(3) Although a large amount of placer yardage may be indicated and inferred in the area, the grade is insignificant and no minable reserves can be calculated.

(4) The area in which the placers are situated is one of the most arid in the Nation. Sufficient water to sustain a placer operation of any size probably cannot be developed near the deposits.

(5) In all probability the necessary equipment and labor is available for the operation of a project such as the applicant proposed.

(6) The deposits are somewhat isolated and at least 10 miles of road must be constructed or rebuilt to permit less difficult access.

(7) The one principal partner of the Association (Espy) has had little experience in mining operations but may have the ability to supervise such a project as is proposed.

RECOMMENDATIONS

Based upon the first 4 conclusions, it is recommended that the application of the Black Magic Mining Association for Government assistance in exploring its placer claims, Docket DMEA-2880, be denied.

3/21/53 gla

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 20 1953

224 New Customhouse
Denver 2, Colorado

July 16, 1953.

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2880 (Monazite and Rare Earths), Black Magic Placer claims, Maricopa County, Arizona.

Enclosed are the original and three copies of the report pertaining to the above application.

The field examination revealed no indications that important amounts of monazite occur on the property.

We recommend that the application be denied.

W. H. King
W. H. King
Field Team, Region IV

A. H. Koschmann
A. H. Koschmann
Field Team, Region IV

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

July 16, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2880 (Monazite and Rare Earths), Black Magic Placer claims, Maricopa County, Arizona.

Enclosed are eleven copies of the final engineering report on the subject docket.

The applicant requested $33,657.50 to delineate and sample the black sands on the group of placer claims.

The field examiners found no evidence that important amounts of monazite occur on the property and they recommend that the application be denied.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

MINING DIVISION
REGION IV

June 29, 1953

Memorandum

To : W. L. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2880, Black Magic Mining Association's Black Magic Placers, Bighorn Mountains, Maricopa County, Ariz. (Monazite and Uranium).

Enclosed are original and 10 copies of the section on Summary, Conclusions and Recommendations by John B. Soule' of the Bureau of Mines and John W. Faick of the Geological Survey, and the section on Engineering by Soule' for the above report. A separate report on the geology will be submitted by the Geological Survey.

As there seems little chance of discovering any significant amount of radioactive material by the proposed exploration work, the DMEA examiners recommend that a loan be denied. I concur with their recommendations.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc W. L. King (10)
R. F. Robinson
DMEA-2880
DF

WRStorms:frj

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
Denver 2, Colorado

July 13, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2080, Black Magic Placer Claims, (Monazite and rare earths), Maricopa County, Arizona

Enclosed please find the original and 10 copies of the geologic report by Raymond F. Robinson of the U. S. Geological Survey covering the above docket.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (11)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O. Box 4186, University Station
Tucson 5, Arizona

July 10, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: R. F. Robinson, Tucson, Arizona

Subject: Docket DMEA 2880, Black Magic Placer Claims, (Monazite and rare earths), Maricopa County, Arizona

Enclosed please find the original and 10 copies of the geologic report on the subject docket.

The applicant wished to conduct exploration of his placer deposit which he believed contained monazite. The samples taken by the examiners failed to contain monazite and the slight radioactivity present appears due to sphene and zircon which are in the gravels.

It is recommended that the loan be denied because there are no indications that important amounts of monazite occur on the property.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2800, Black Magic Mining Association, Black Magic Placers
Bighorn Mountains, Maricopa County, Arizona
(Monazite?, Uranium?)

John H. Soule', Mining Engineer
U. S. Bureau of Mines

John E. Frick, Geologist
U. S. Geological Survey

June 1953

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By John H. Soule[1], and John N. Faick[2]

Radioactivity recently was discovered in black sands occurring in creek placers in the Bighorn Mountains, Maricopa County, Ariz. The Black Magic Mining Association located a group of placer claims consisting of 32 claims of 160 acres each. This association, a partnership, applied for Government assistance from the Defense Minerals Exploration Administration to explore the claims. This application, Docket DMEA-3890, was sent to the field for an examination of the property. Exploration by drilling to cost an estimated $33,687.50 was proposed by the applicant.

The Black Magic placer claims are situated in one of the most arid areas of the Nation. Summers are very hot but the winters usually are mild. Precipitation is scanty and no permanent streams exist in the area. Probably no large quantity of subsurface water could be developed near the claims. The area is somewhat isolated. There is no nearby source of equipment, supplies and labor. Living accommodations are limited.

Two general types of placer gravels occur in the area. The older bank gravels show little sorting and contain large rock fragments, mostly from volcanic rocks with some from the granite basement rock. The more recent gravels are more sandy in texture and largely are the older gravels that have been reworked by stream action. These later

---

1/ Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

gravels are not as extensive as the older ones. Both types of gravels are poorly consolidated. Bedrock outcrops at a number of places in the area.

The black sand concentrates from the gravels contain a small amount of radioactivity. The applicant sampled some of the creek gravels and submitted the concentrates obtained from them to the Ding's Magnetic Separator Co. who parted the concentrates into 13 fractions. These fractions were submitted to the Lindsey Chemical Co. who determined the monazite content of each fraction. It seems that monazite was not verified by microscopic nor chemical tests. The gravels contained less than 0.1 percent of monazite based upon the above data.

One sample from a nearby area was reported by the Atomic Energy Commission to contain a small amount of thorite. No monazite nor thorite was noted, microscopically or chemically, in the samples taken by the DMEA examiners and submitted to the Metallurgical Division of the Bureau of Mines. The small amount of radioactivity, 0.009 to 0.01 percent U_3O_8 equivalent in the best sample, was determined to have been derived from radioactive sphene and altered zircon.

Although there is a considerable quantity of gravels on the Black Magic placer claims, the content of radioactive minerals is negligible and a significant discovery is highly improbable. Sufficient water to sustain a placer operation of any size probably could not be developed near the area.

Because of the insignificant amounts of radioactive material in the Black Magic placers and the lack of water to sustain a placer operation, it is recommended that the application for Government assistance to explore the Black Magic group of claims, Docket DMRA-2880, be denied.

BLACK MAGIC PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(MERMAKIN AND BARE BARINS)
HENRY C. TEPT, APPLICANT
IMBA 2860

Geologic Report

By
John H. Feick
Geologist, U. S. Geological Survey

BLACK MAGIC PLACER CLAIMS
MARICOPA COUNTY, ARIZONA
(Monazite and Rare Earths)

BMRA 2680

By
John H. Faick
Geologist, U. S. Geological Survey

CONTENTS

	Page
INTRODUCTION	1
GENERAL GEOLOGY	1
DESCRIPTION OF THE PLACER DEPOSITS	2
SAMPLES AND GRADE	5
ORE RESERVES	6
POSSIBLE EXPLORATION	8
CONCLUSIONS	9
RECOMMENDATIONS	9

ILLUSTRATIONS

Figure 1	Location Map	See Engineering Report
Figure 2	Claim Map	" " "
Figure 3	Sketch Map - Black Magic Placer Claims	To Follow Page 2

INTRODUCTION

The Black Magic Placer Claims, consisting of 32 unpatented placer claims of 160 acres each on approximately 3840 acres, was examined May 18-19, 1953. The claims were examined by J. H. Soulé, Engineer, U. S. Bureau of Mines, and J. H. Faick, Geologist, U. S. Geological Survey for the Defense Minerals Exploration Administration, which is in receipt of an application for Government assistance in exploring the property for monazite and rare earth minerals, some of which are radioactive.

The property was shown to the field examiners by Murry G. Rapp, 714 E. 7th Avenue, Phoenix, Arizona, who is the principal owner and manager of the group of claims.

GENERAL GEOLOGY

The Black Magic Placer Claims are situated in T. 4 N., R. 9 W. in the southwestern part of the Bighorn Mountains, and are about 85 miles northwest of Buckeye, Arizona. The Bighorn Mountains consist of a roughly eroded mass of intrusive and extrusive igneous rocks which rise several hundred feet above the Hassayampa plain, a broad detrital filled valley now occupied by Centennial Wash, which lies a few miles southwest of the mountains.

The climate is arid with a rainfall of only a few inches a year, consequently living and working conditions are

rendered unfavorable by the lack of water and by the intense heat of summer. There are no permanent streams in the area, but the mountains are drained by numerous arroyos which flow southeastward to the plains after heavy rains. In some of the larger arroyos in the mountains, water may be obtained in small amounts from shallow alluvium. Near the base of the mountains, the applicant has a well from which domestic supplies of water are obtained at a depth of 460 feet. In the Marquahala plain, at a distance of from 5 to 10 miles southeast of the Black Magic claims, ground water is now being pumped in sufficient quantity to irrigate a few thousand acres of farm land.

The part of the Bighorn Mountains in which the Black Magic placer claims are situated is composed of gray coarse grained, nearly equigranular granite of probable pre-Cambrian age, and of Tertiary volcanics, which are several hundred feet thick, and which consist mostly of andesites, rhyolites and agglomerates. The volcanics rest upon an erosion surface developed upon the granite, and the erosion surface has a relatively low relief which probably does not exceed 100 feet in the area occupied by the Black Magic claims.

DESCRIPTION OF THE PLACER DEPOSITS

Part of T. 4 N., R. 9 W. is drained by a large arroyo and its numerous tributaries (See Fig. 3), which have removed

the volcanics from large areas and have eroded shallow channels into the underlying pre-Cambrian granite. Most of the volcanics have been removed and the underlying granite exposed in a basin-like area about 3 miles wide and about 5 miles long. Most of the floor of this basin-like area is covered with gravel and sand except in a few small scattered areas where granite or volcanic rocks crop out. The depth of the alluvium is unknown, but the fact that granite and volcanics crop out in several places in the floor of the basin or along the course of the arroyo indicates that the gravel is not deep. This writer believes that the post-Tertiary erosion has cut only slightly into the pre-Cambrian granite and that the present topography is influenced to a moderate extent by the character of the pre-Tertiary erosion surface.

The alluvial deposits are of two relatively different ages and both of these are composed of sand and gravel derived from the pre-Cambrian granite and from Tertiary volcanics. Both the older and younger alluvium contain small amounts of "heavy" minerals, but the greatest concentration is in the sands and gravels of the present stream channels.

The older alluvium is composed of boulders ranging from about 2 inches to about 10 inches in diameter, and contain a high proportion of sand and gravel. The material is slightly

consolidated, and in places it is firmly cemented by caliche. This older alluvium apparently covered the basement rocks to a depth of many tens of feet, and the younger drainage channels have developed by erosion of it.

The alluvium in the younger channels consists of loose unconsolidated sands and small-sized gravels along the bottom of the recent drainage channels. These channels are very irregular and sinuous and range in width from about 25 feet to about 150 feet and have cut into the older valley fill to depths of from 5 to 15 feet. Most of the alluvial material in these recently formed deposits is derived by reworking at the older fill, although a small part of it may have been derived by recent erosion of the presently exposed surfaces of granite and volcanics.

The heavy minerals, some of which are slightly radioactive, consist principally of magnetite with which are associated other heavy minerals. These heavy minerals are concentrated as black sands in very thin layers or coatings on the surfaces of the present stream sands and also form thin bands or layers, seldom over an inch thick, that are interbedded with the unconsolidated sands in the floor of the arroyo. The presence of heavy sands is usually indicated by magnetite.

The deposits have been prospected by several test pits, which range from a few inches to about 5 feet deep.

These reveal the existence of thin beds and disseminated particles of black sand throughout the area prospected by the pits, but none of the work done to date has penetrated deep enough to determine if greater concentrations of black sand are to be found on bedrock. The wide distribution of the heavy sand, and the slightly disseminated nature of it, indicates that there has probably been but little natural concentration of the heavy minerals.

The source of the heavy sands undoubtedly is the pre-Cambrian granite because several small arroyos draining areas of exposed granite contain black sand, whereas arroyos draining areas of volcanics apparently do not contain the heavy sands. None of the heavy minerals are visible in the granite, however, they are undoubtedly present as minor or accessory minerals.

SAMPLES AND TESTS

Four samples (See Fig. 3 for location) were taken by the applicant and concentrated by him by panning. In the samples the heavy minerals were found by panning to constitute from 2 to 16 percent of the alluvium and averaged about 9 percent.

The concentrates obtained by panning were submitted by the applicant to Ding's Magnetic Separator Company which separated 6800 grams of the concentrate into 13 fractions

dependent upon magnetic susceptibility. The concentrate fractions were then submitted to the Lindsey Chemical Company which reported the presence of monazite. The identification of monazite is questioned because none was found by the careful mineralogical and chemical tests made for B.M.R.A.

The combined results of analysis made by the Ding's Magnetic Separator Company and Lindsey Chemical Company on the panned concentrate submitted by the applicant is summarized in the following table. In this table the indicated percentage of monazite in the gravels was calculated by J. H. Soulé.

Fractions of sample	Weight in grams	Percent of sample	Grams of monazite in fraction	Percent of monazite in fraction	Percent monazite in gravels
A	4900	72.1	None	None	None
B-F	1134	16.6	11.34	1.0	0.0150
G-M	766	11.3	62.25	8.00	0.0904

It can be seen from the above table that 72 percent of the concentrates contained no monazite. All of the monazite is contained in the remaining 28 percent of the sample, represented as fractions B-F and G-M in the above table. These samples indicate that the original gravels contained less than 0.1 percent monazite, or other minerals reported as monazite.

During this examination 6 samples (Location of 1, 2 and 5 are shown on Fig. 3) were taken and were submitted to the Metallurgical Division of the U. S. Bureau of Mines at

Tucson, Arizona, for analysis. These samples are described as follows:

Field No.	U.S.B.M. No.	Description
1	3439	5.0-foot sample from east test pit
2	3440	5.0-foot sample from west test pit
3	3441	General sample from 5 miles of creek bed
4	3442	General sample of selected black sand from 5 miles of creek bed
5	3443	4.0-foot channel from gravel banks next to creek
6	3444	Cuttings from old shaft drill hole

The minerals identified in the heavy mineral concentrates are magnetite, hematite, sphene, hornblende, biotite, garnet, ilmenite, and zircon. Monazite and thorite minerals were not found in the samples taken by D.M.E.A. Microscopic observations were substantiated by chemical analysis which yielded less than 0.1 percent combined rare earth minerals.

The investigation revealed that most of the radioactivity in the placer sands was associated with the sphene and altered zircon. The equivalent percent of U_3O_8 ranges from zero to a maximum of 0.12 percent. The radioactivity is restricted to a non-magnetic portion having a specific gravity greater than 2.8, and this radioactive fraction constitutes only about 4 percent of the sample tested. These samples indicate that the gravels sampled contain U_3O_8 equivalent ranging from

about 0.005 percent to about 0.01 percent. These samples were taken at widely separated localities but are undoubtedly representative of the material available.

ORE RESERVES

Although many millions of yards of gravel are present within the boundaries of the Black Magic placer claims no effort was made to calculate the tonnage because examination of the deposits failed to reveal the existence of significant amounts of radioactive minerals or rare earths. At no place are the radioactive minerals concentrated in mineable quantities.

POSSIBLE EXPLORATION

The applicant proposed to explore the Black Magic placer claims at a total cost of $33,657.50. The proposed method of exploration was to drill the deposit with a diamond drill machine equipped with an Acker soil auger. It was proposed to drill 200 holes having an average depth of 20 feet.

Examination reveals that the material is not sufficiently consolidated to permit sampling with a small diameter auger-drilled hole. It could only be satisfactorily sampled with cased holes or test shafts. Possible methods of exploration were not suggested to the applicant because there was no apparent justification for exploring the deposit.

minerals, therefore it is recommended that the application for Government assistance be denied.

DMMA-2080, Black Magic Mining Association, Black Magic Placers
Bighorn Mountains, Maricopa County, Arizona
(Monazite?, Uranium?)

Engineering Report

By John H. Soule, Mining Engineer
U. S. Bureau of Mines

June 1953

DMEA-2880 - BLACK MAGIC MINING ASSOCIATION, BLACK MAGIC PLACERS
BIRDHORN MOUNTAINS, MARICOPA COUNTY, ARIZONA
(MONAZITE?, URANIUM?)

CONTENTS

Engineering report	Page
Introduction	1
Acknowledgments	1
Location, topograph and physical features	1
History and production	3
Ownership and extent	4
Description of the deposits	4
Minable ore reserves	5
Present status	12
Proposed project and costs	12
Conclusions	13
Recommendations	14

TABLES

Number		Page
I	Concentration Ratio	6
II	Results from applicant's samples	6
1	(Metallurgical) Fractionation of Black Sands from Bureau of Mines samples	10

ILLUSTRATIONS

Figure		Following page
1	Location map	2
2	Claim map	4

INTRODUCTION

Radioactive material recently was discovered in the black sands in certain placer areas in the Bighorn Mountains in western Maricopa County, Ariz. Many placer claims were located and the locators of one group, the Black Magic Mining Association, applied to the Defense Minerals Exploration Administration for Government assistance to explore the claims. The application, Docket DMEA-2580, was sent to the field for an examination of the property. This examination was made on May 19, 1953 by the DMEA Field Team consisting of John N. Faick of the United States Geological Survey and John L. Soule[1] of the United States Bureau of Mines

ACKNOWLEDGMENTS

Acknowledgment is due Harry G. Espy, one of the principal partners of the Black Magic Mining Association, for showing the examining team over the Black Magic group of claims and for furnishing data pertaining to the property. Acknowledgment also is due the Metallurgical Division of the Bureau of Mines in Tucson for the work it did on samples submitted to it.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Black Magic placer claims are situated in the lower half of T. 4 N., R. 9 W., in the northwestern part of Maricopa County, Ariz. The property is reached by travelling west from Buckeye, Ariz. on U. S. Highway 80 for 9.5 miles to Massayampa, Ariz. Turn right or northwesterly off U. S. Highway 80 at the western edge of Massayampa

and follow the "Parker Cutoff" road towards Salome, Ariz. for 31.1 miles, thence off this road to the right, or northerly following a poor road for 2.3 miles. Take the right fork and continue northerly for 1.2 miles to the Kepp homestead. From the homestead, travel westerly for about one mile, thence northerly for an additional 3 miles to a large dry wash. This wash courses easterly towards its head through the important part of the property. This wash to the east, and its tributaries for a distance of about 5 miles contain the gravels that have concentrations of the slightly radioactive black sands. The route from Buckeye to the property is shown in figure 1. Travel up the dry washes containing the placers is improbable in motor vehicles without four-wheel drive.

The topography is typical basin and range. The Bighorn mountains near the area are rugged and reach an altitude of approximately 3,000 feet. The placer deposits are situated in a small basin in the western part of the mountains and largely are flanked by low foothills. The deposits are at an approximate altitude of 1,650 feet.

The area is typical desert and is in one of the most arid parts of the state. Summer temperatures are very hot but the winters usually are mild. Freezing weather is rare. Precipitation is scanty, probably averaging less than 10 inches per year. Most of the precipitation occurs as heavy thunder showers in the summer which tend to obliterate the little travelled back roads. There are no permanent streams in the area, but small amounts of water occur in nearby wells at depths reported to be only a few hundred feet below the surface. Considerable

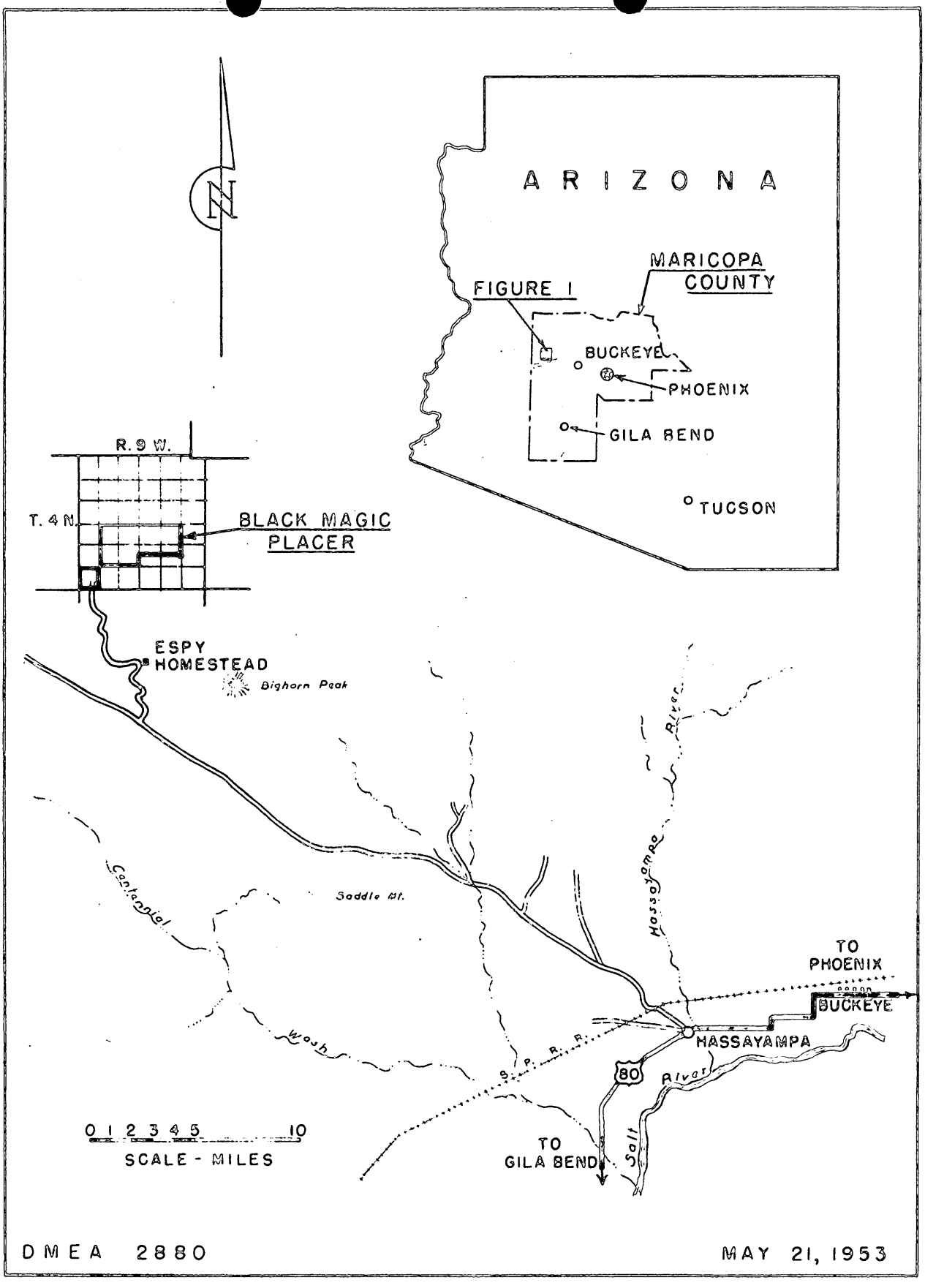


FIGURE 1. - LOCATION MAP - BLACK MAGIC PLACER
MARICOPA COUNTY, ARIZONA

water for irrigation purposes is being developed in the Centennial Wash, about 10 miles south of the placer deposits. It is probable that no large amount of subsurface water could be developed any nearer the Black Magic claims because of their proximity to the mountains.

Ironwood, palo verde, and mesquite trees dominate the landscape near the washes and creeks. Greasewood and cholla abound with other varieties of shrubs and cactus present. None of the trees would furnish timber suitable for mining purposes.

There are no living accommodations near the deposits other than 2 houses on the Kagy homestead. Services and supplies are nonexistent and Phoenix, Ariz., about 80 miles by road to the east, would be the source of major mining supplies and equipment. Minor supplies are obtainable at Buckeye, about 85 miles by road to the southeast, at Salome, Ariz., about 40 miles by road to the northwest, and at Aguila, Ariz., about 15 miles by road to the north. Aguila on the Santa Fe railroad is the nearest rail point, but Dixie siding on the Southern Pacific railroad, nearly 40 miles to the southeast, possibly is the most accessible.

HISTORY AND PRODUCTION

The presence of radioactive material in black sands obtained from placers near the Bighorn Mountains was a relatively recent discovery. A number of claims were located as the K. N. Greenleaf group. Further prospecting revealed radioactivity in black sands from placers to the north. Thirty-one placer claims of 160 acres each were located

on this later discovery. This group of claims is called the Black Magic group and was located by the Black Magic Mining Association of Phoenix, Ariz. This claim group is shown in figure 2. There has been no production of radioactive material from any placers in the area.

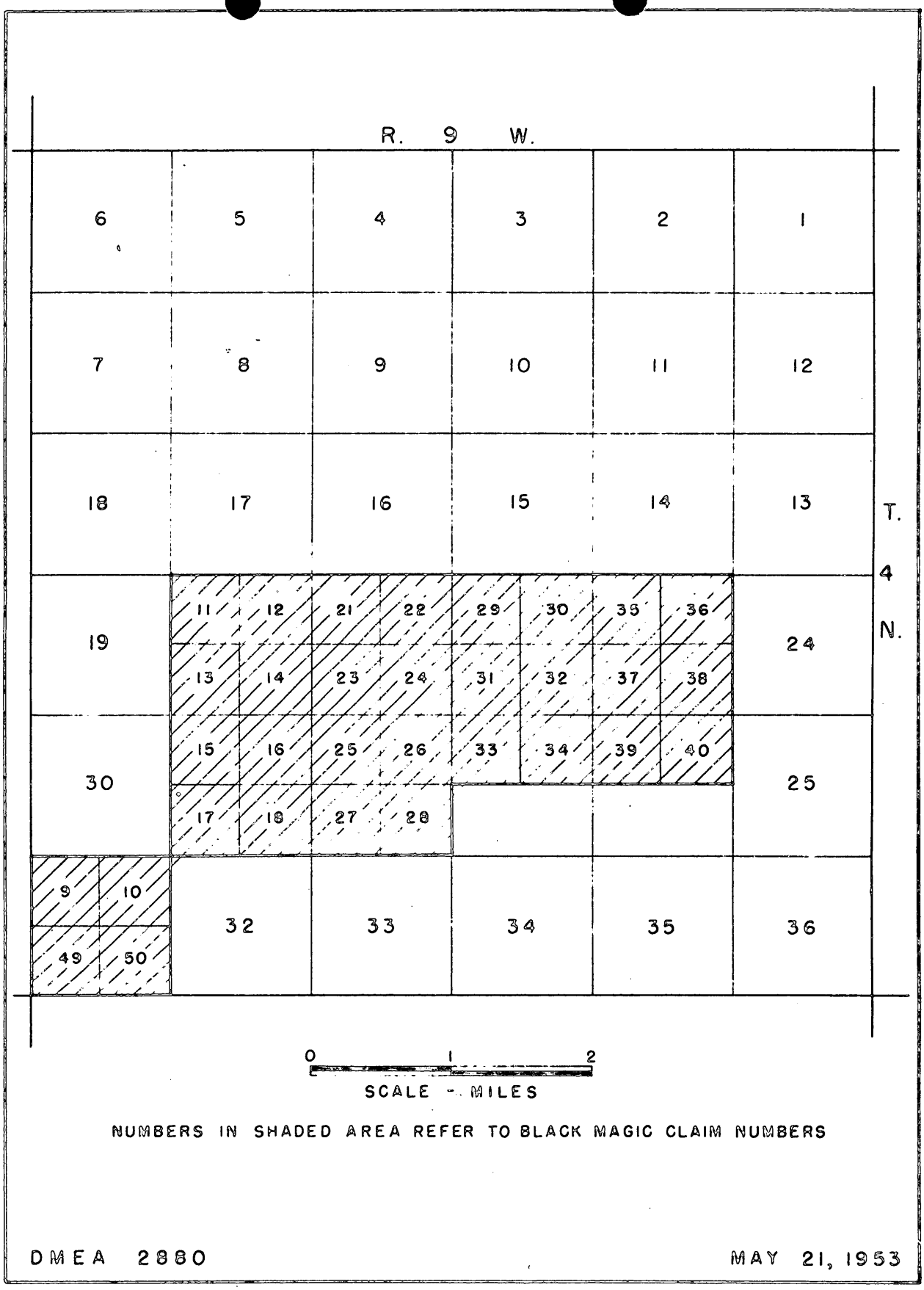
OWNERSHIP AND EXTENT

The Black Magic group of placer claims consists of 32 claims of 160 acres each as shown in figure 2. This group was located by the Black Magic Mining Association, a partnership composed of the following members: Murry O. Eggy and John L. Holt, general partners, and Viola W. Holt, Ruby B. Eggy, Lucille Woodward, O. L. Eggy, Jr., Archie Webb, and Ernest O. Kneale, limited partners. The address of the association is 714 North 7th Avenue, Phoenix, Ariz. None of the claims are patented and all are of recent location.

DESCRIPTION OF THE DEPOSITS

The oldest rock in the area of the Black Magic placer deposits is a coarsely crystalline, slightly porphyritic granite of pre-Cambrian age. This is overlain in places by a series of Tertiary volcanics of varying texture and composition. Tuffs and obsidians were noted, as well as flows of more basic character. Recent basalts were seen in the general area, but none were noted near the placers.

There are 2 general types of placer deposits in the area. The older consists of poorly classified gravels containing rock fragments as large as 10 inches in diameter. Most of the rock fragments were derived from the Tertiary volcanics (about 90 percent), and the



NUMBERS IN SHADED AREA REFER TO BLACK MAGIC CLAIM NUMBERS

DMEA 2880

MAY 21, 1953

FIGURE 2. - CLAIM MAP - BLACK MAGIC PLACER

remaining fragments were of granite. No concentrations of black sands were noted in these gravels although some sand was present (approximately 3 percent). The black sands were disseminated throughout the gravels and were not concentrated in any one place.

The second type of placer consists of more recent creek gravels, in all probability derived from the older gravels reworked by stream action. The recent gravels are sandy textured with but few large rock fragments. Concentrations of black sands are common but not extensive. These creek gravels contain approximately 11 percent of black sands. Both types of gravels are poorly consolidated. Test pits in the recent gravels show that the walls are firm enough to stand for short periods of time. Flash floods usually obliterate the pits.

MINABLE ORE RESERVES

Large reserves of placer gravels can be indicated and inferred on the Black Magic claims. Four test pits reportedly were sampled by the applicant and 2 of the pits reportedly sampled were resampled by the engineer of the Bureau of Mines. In addition, the engineer took 2 general samples along 5 miles of the main creek, one of the black sand concentrations, and the other thought to be more representative of the creek gravels. One sample was taken of the older and coarser bank gravels. One sample of well drill-cuttings from near the area was submitted by the applicant.

The samples reportedly taken by the applicant were panned by Kapp and the concentrates obtained were combined for further treatment. His reported ratio of concentrates to gravels is shown in the following table:

TABLE I. Concentration ratio of the applicant's samples.

Pit No.	Black sand concentrates percent
AX	2.25
BX	10.00
CX	8.00
DX	15.00
Arithmetic average	9.06

The combined concentrates obtained from the above samples reportedly were submitted to the Bing's Magnetic Separator Co. which separated the concentrates into 13 fractions depending upon their magnetic susceptibility. These fractions then were sent to the Lindsey Chemical Co. which determined the monazite content of the different fractions. The results were reported as percent of monazite in the fractions but it is not known whether the presence of monazite was verified by chemical or microscopic methods. One sample from a nearby area was submitted to the Atomic Energy Commission who reported a small amount of thorite in the sample.

The combined results of the work done on the applicant's samples and their reduction to the grade of the gravels from the data of Table I is shown in the following Table II:

TABLE II. Results obtained from the applicant's samples.

Sample fraction	Weight, grams	Percent of whole	Monazite in Concentrates Percent	Monazite in Concentrates Grams	Monazite in gravels, Pct.
A	4,900	72.1	None	None	None
Total A	4,900			None	None
B	471	6.9	-1.0	-4.71	-0.0063
C	368	5.4	-1.0	-3.68	-0.0049
D	128	1.9	-1.0	-1.28	-0.0017
E	64	0.9	-1.0	-0.64	-0.0008
F	103	1.5	-1.0	-1.03	-0.0014
Total B-F	1,134	16.6		-11.34	-0.0150

TABLE II. Continued.

Sample fraction	Weight grams	Percent of whole	Monazite in Concentrates Percent	Grams	Monazite in gravels, pct.
G	38	0.6	5.0	1.90	0.0025
H	17	0.2	10.0	1.70	0.0026
I	25	0.4	20.0	5.00	0.0066
J	65	1.0	20.0	13.00	0.0172
K	42	0.6	20.0	8.40	0.0111
L	22	0.3	20.0	4.40	0.0058
M	557	8.2	-5.0	-27.85	-0.0369
Total G-M	766	11.3		-62.25	-0.0824
Total B-M	1,900	27.9		-73.59	-0.0974
Total A-M	6,800	100.0		-73.59	-0.0974

It can be seen from the above table that the bulk of the concentrates, 72 percent, contained no monazite. This material largely is magnetite. The remaining 28 percent of the concentrates contained all of the reported monazite which converts to less than 0.1 percent of monazite per ton of gravel. No work was done on the concentrates to determine whether or not an acceptable grade of monazite concentrate could be obtained.

Five samples were taken by the Bureau of Mines engineer and submitted, with one sample taken by the applicant, to the Metallurgical Division of the Bureau of Mines at Tucson, Ariz.

The results obtained by the Metallurgical Division is reported as follows:

"REPORT OF MICROSCOPIC EXAMINATION OF SIX PLACER SAND SAMPLES FROM THE BLACK MAGIC PLACER CLAIMS, MARICOPA COUNTY, ARIZONA

By: Lamar C. Evans

Introduction

"Six samples from the Black Magic Placer Claims, Maricopa County, Arizona (BMMA Docket No. 2880) were submitted by J.M.Soule' for examination to determine the monazite and thorite content. Fractionation tests also were made to determine the relative amounts of radioactive minerals.

"Source of the Samples

"The sample location of each of the sands is as follows:

Sample No.	
3439	5.0-foot channel from test pit east
3440	5.0-foot channel from test pit west
3441	General creek sample from 5 miles of creek
3442	Selected Black Sands, general sample from 5 miles of creek.
3443	4.0-foot channel from gravel banks next to creek
3444	Cuttings from old churn drill hole

"Description of Samples

"The sample as received were substantially finer than 4 mesh except for a few pebbles that graded in size up to about 1-1/2 inches. Representative head samples of each of the sands were screened into three products, a plus 6-mesh, minus 6 plus 100-mesh and minus 100-mesh. Radiometric and visual observations of the plus 6-mesh and the minus 100-mesh fractions showed that they did not contain any appreciable radioactivity.

"The minus 6 plus 100-mesh fraction which was the predominant grain size in the sands was magnetically separated to remove the magnetite. The non-magnetic portion was further fractionated with heavy liquids at a specific gravity of 3.8 to recover the heavy minerals which exhibited virtually all of the radioactivity. Results of the fractionation tests on each of the samples are given in table 1.

"Microscopic examination of the heavy mineral concentrates of the minus 6 plus 100-mesh fractions of the different sands revealed that samples Nos. 3439, 3440, 3441 and 3442 were very similar in mineral composition. The minerals identified were magnetite which has been partly altered to hematite, hematite, sphene and minor amounts of hornblende, biotite, garnet, ilmenite, zircon and altered zircon. The heavy mineral concentrates of samples 3443 and 3444 were composed chiefly of biotite and minor amounts of altered magnetite, hematite, sphene, ilmenite, chlorite, garnet and zircon, (sink at 3.8 sp. gr.).

"Although the placer sands were reported to contain appreciable monazite and thorite these minerals were not found. These microscopic observations were further substantiated by chemical analysis for combined rare earths on the minus 6 plus 100-mesh heavy mineral concentrate. The chemical analysis gave less than 0.01 percent combined rare earths.

"During the course of the investigation it was found that most of the radioactivity in the placer sands was associated with the sphene and altered zircon which reported in the heavy mineral concentrates. The equivalent percent U_3O_8 in each of the heavy mineral fractions of the different samples is given in table 1.

"Conclusions

"Microscopic examinations and confirmatory chemical analyses of the six placer sands submitted for identification revealed that they do not contain any significant amounts of monazite or thorite. Most of the radioactivity in these placer sands is due to uranium-bearing sphene and zircon.

TABLE 1. Fractionation of Black Sands From the Black Magic Placer Claims, Maricopa County, Ariz.

Sample No	Product	Weight, grams	Weight, percent	Equivalent Percent U_3O_8	Chemical Percent U_3O_8
3439	+6 Mesh	196	15.8	Nil	-
	-6 + 100 mesh (magnetic)	168	13.5	Nil	-
	-6 + 100 mesh (sink 2.8 sp. gr.)	32	2.6	0.06	-
	-6 + 100 mesh (float 2.8 sp. gr.)	832	66.9	Trace	-
	minus 100 mesh	15	1.2	Trace	-
	Composite Head	1243	100.0		
3440	+6 mesh	429.6	27.4	Trace	-
	-6 + 100 mesh (magnetic)	94.2	6.0	Nil	-
	-6 + 100 mesh (sink 2.8 sp. gr.)	30.2	1.9	0.04	-
	-6 + 100 mesh (float 2.8 sp. gr.)	998.5	63.6	Nil	-
	-100 mesh	16.5	1.1	Trace	-
	Composite Head	1569.0	100.0		
3441	-6 mesh	384.8	25.7	Trace	-
	-6 + 100 mesh (magnetic)	105.9	7.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	36.7	2.4	0.04	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	938.3	62.6	Nil	-
	-100 mesh	34.4	2.3	Trace	-
	Composite Head	1500.1	100.0		

Table 1. Fractionation of Black Sands from the Black Magic Placer Claims, Maricopa County, Ariz. (Con't.)

Sample No.	Product	Weight, Grams	Weight, percent	Equivalent Percent U_3O_8	Chemical Percent U_3O_8
3442	+6 mesh	79.3	7.0	Nil	-
	-6 + 100 mesh (magnetic)	439.0	39.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	85.0	7.5	0.12	.045
	-6 + 100 mesh (float at 2.8 sp. gr.)	496.0	44.0	Nil	-
	-100 mesh	28.0	2.5	Trace	-
	Composite Head	1127.3	100.0	0.009	-
	Determined Head				.01
3443	+6 mesh	920	24.6	Nil	-
	-6 + 100 mesh (magnetic)	30	.8	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	85	2.3	0.02	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	2016	53.8	Nil	-
	-100 mesh	693	18.5	Trace	-
	Composite Head	3744	100.0		
3444	+6 mesh	28.0	4.8	Nil	-
	-6 + 100 mesh (magnetic)	5.9	1.0	Nil	-
	-6 + 100 mesh (sink at 2.8 sp. gr.)	26.1	4.5	0.1	-
	-6 + 100 mesh (float at 2.8 sp. gr.)	335.9	57.5	Nil	-
	-100 mesh	188.2	32.2	Trace	-
	Composite Head	584.1	100.0		

Sample Nos. 3439, 3440, and 3441 are considered representative of the upper portions of the creek gravels and contained less than 0.0011 percent U_3O_8 equivalent; Sample No. 3442 was a special sample of the black sand concentrations representative only of such. This sample contained 0.009 percent U_3O_8 equivalent. This was verified by chemical analysis which converted to 0.01 percent U_3O_8. Sample No. 3443 may be considered representative of the upper part bank gravels and contained less than 0.0005 percent U_3O_8 equivalent. Sample No. 3444 of the well drill-cuttings contained less than 0.005 percent U_3O_8 equivalent. In discussing the representativeness of the samples, it is admitted that they are far spaced but are felt sufficiently representative for the purpose of this report.

Although the quantity of bank and creek gravels may be measured in the millions of cubic yards, it is evident from Table III that no ore reserves can be calculated for the Black Magic placers. From these results, it must be concluded that a significant discovery is not probable.

PRESENT STATUS

The Black Magic group of placer claims is entirely undeveloped. Other than a few test and location pits, no other work has been done on the property. No work is being done on the claims at the present time.

PROJECT PROPOSALS AND COSTS

The Black Magic Mining Association, the applicant for Government assistance to explore the placer claims, proposed a project to cost an estimated $33,657.50. The proposed work was to have consisted of drilling

200 holes to an average depth of 20 feet. The drilling was to have been done with diamond core drill type of equipment using Acker soil sampling tools.

A study of the placers revealed that they are too loosely consolidated to permit the taking of satisfactory samples by ordinary drilling methods. If xxx drilling is used, the hole must be cased and the gravel within the casing carefully removed. This would cost more than estimated by the applicant. Three types of sampling augers were tried by the engineer of the Bureau of Mines with unsatisfactory results because of the loose character of the gravels. Perhaps testpitting would be the best method of obtaining representative samples as shown by the pits on the property. The depth to which test-pitting could be done might be limited by safety considerations.

CONCLUSIONS

The following conclusions were derived from an examination of the Black Magic placer claims, from information supplied by the applicant, and from work done by the Metallurgical Division of the Bureau of Mines on samples taken by the Bureau of Mines engineer.

(1) The black sand concentrates of the placers contain a small amount of radioactivity. The radioactive mineral was determined to be radioactive sphene and altered zircon. No significant quantities of thorite or monazite occurred in the samples taken by the Bureau of Mines engineer.

(2) The monazite(?) content of the samples taken by the applicant was less than 0.1 percent in the gravels. The radioactive sphene and altered zircon in the Bureau of Mines samples constituted less than

0.01 percent U_3O_8 equivalent in the best sample. More representative samples contained 0.0011 and 0.00046 percent U_3O_8 equivalent as radioactive sphene and altered zircon in the creek and bank gravels respectively.

(3) Although a large amount of placer yardage may be indicated and inferred in the area, the grade is insignificant and no minable reserves can be calculated.

(4) The area in which the placers are situated is one of the most arid in the Nation. Sufficient water to sustain a placer operation of any size probably cannot be developed near the deposits.

(5) In all probability the necessary equipment and labor is available for the operation of a project such as the applicant proposed.

(6) The deposits are somewhat isolated and at least 10 miles of road must be constructed or rebuilt to permit less difficult access.

(7) The one principal partner of the Association (Kegy) has had little experience in mining operations but may have the ability to supervise such a project as is proposed.

RECOMMENDATIONS

Based upon the first 4 conclusions, it is recommended that the application of the Black Magic Mining Association for Government assistance in exploring its placer claims, Docket DMRA-2000, be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

FILE COPY
SURNAME:

Murphy
Ellis
Hedges
Fitzpatrick

Mr. Murry C. Kapy
Black Magic Mining Association
714 North 7th Avenue
Phoenix, Arizona

APR 17 1953

Re: Docket No. DMEA-2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claim
Maricopa County, Arizona

Dear Mr. Kapy:

The application for assistance in exploring your property in Maricopa County, Arizona, under the above captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. Your application has been referred for field examination to the Executive Officer of Region IV at the following address:

Mr. W. King
Executive Officer, Region IV
DMEA Field Team
224 New Customhouse Building
Denver 2, Colorado

The Regional Office will contact you at the earliest opportunity in regard to your project.

Sincerely yours,

C. O. Mittenderf (for)
Administrator

MFMurphy/cmf 4/14/53

cc to: Adm. Reading File
Docket
Messrs. Ellis
Murphy
Field Team, Region IV (2)

FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Murphy
Ely
Selfridge
Heydinsdt

APR 17 1953

Mr. W. H. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-2880
(Beryllium and Rare Earth Minerals)
Black Magic Placer Claim
Maricopa County, Arizona

Dear Mr. King:

The captioned application is referred to your office for a field examination.

J.C. 4/17/53

Copies of additional information on the Black Magic Placer from Mr. Harry C. Rapp, dated March 7, and March 30th, 1953, including maps of the mine are enclosed. Also enclosed are memoranda from Mr. E. J. Carlson dated February 13, and Mr. R. E. Van Alstine dated February 20, 1953.

Before making an examination of this property it might be advisable to request the owners to clean out some of the test pits that they have sampled, as the pits may have caved.

The six lines indicated on the map for drilling, cover the Northeast-Southwest direction at good intervals, but the spacing of the holes on these lines at only 200 feet intervals seems too close for scout drilling. The usual distance is 800 feet between holes and 400 feet under exceptional cases where the overburden is shallow.

Mr. Rapp's suggestion of using Acker soil sampling tools and sinking the holes to only 20 feet, instead of using a standard drill of the Keystone type and drilling to bed rock should be questioned.

One copy of the application and related data were retained by your office.

Sincerely yours,

Thomas C. Selfridge (JHB)
Chairman, Operating Committee

Enclosures 4 and 3 maps

J. H. Rodgers (JHB)
Member, Geological Survey

A. R. Kinkel, Jr. (JHB)
Member, Bureau of Mines

MFMurphy/eef 4/13/53
cc to: Adm. Reading Files
Operating Committee
Docket G-23
Messrs: JMLarrabee GSA.Rm.3528
EJCarlson, 3649
DMEA FT, REG.IV. Miss Murphy

4/2/53 gla

Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 31 1953

March 30,1953

Ernest Wm. Ellis,Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25,D.C.

Re: Docket No.2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

In answer to your question stated in paragraph 2 of your letter of March 17,1953, no chemical analysis of samples Ax,Bx,Cx,Dx, was made. The radioactivity of the samples was measured with a Geiger counter.

To supplement the information given in my letter of March 7 in paragraph 2, I might add that the sample of about two hundred pounds of heavy concentrates was a composite sample made up of material secured from the test holes dug during April and May. The approximate location of these holes were designated by red dots on the map of the claims. About one hundred pounds of this composite sample was sent to the Dings Magnetic Separator Company for separation and the thirteen separation products were examined for their monazite content by the Lindsay Chemical Company. (For the results see copies of reports enclosed herewith.) The results do indicate the presence of monazite , however, they suggest that a different procedure for separation would be necessary, perhaps the use of both magnetic and electrostatic procedure. The location of the test holes from which the samples were taken to make up the composite sample and the measuring of each sample for radioactivity at least suggests but does not necessarily prove that radioactivity from each samplemaking up the composite sample come from a monazite content. This same suggestive conclusion applies to samples taken from test holes,Ax,Bx,Cx,and Dx.

I believe that a copy of the report on two samples examined by the Chemical and Physical Section, Metallurgical Division Region IV, Bureau of Mines, Salt Lake City is included in the supporting papers of our application.

Radioactive black sands were first discovered on another group of claims south of the Black Magic group, in sections3,4,and5 of Township 3 north,Range 9 west, and known as the E.N. Greenleaf Enterprize group. A granitic ridge outcrops in the above named sections and in this ridge pegmatite can be observed at several places. A sample of the black sand,first discovered, was given to the Dept. of Minerals Resources in Phoenix, who in turn gave the sample to a representative of the A.E.C.. Herewith is a copy of his report of an examination of the sample as made by the A.E.C..

Docket No.DMEA-2880
March 30,1953

Until we learned of the monazite content in the heavy concentrates of the Black Magic group, we had assumed that the radioactivity come from allanite and thorite as reported for the sample from the E.N. Greenleaf group by the examination made by the A.E.C. Then further prospecting of the Black Magic group indicated that the black sands in that group apparently originated several miles to the north east of the E.N.Greenleaf group. The decision was made to make the two groups different projects.

Another map including the numbered sections in which are located the Black Magic claims is submitted. On this map, Tertiary volcanic outcrops are indicated roughly with red shading and the main drainage channels which flow to the southwest are indicated. Between these main channels are smaller contributing channels that are not indicated on the map. Heavy concentrates have been traced up all these main washes shown on the map in the observation of patches of black sand exposed on the surface of the alluvial material and apparent layers exposed in holes dug in the channels. With but very few exceptions these concentrates appearing as black sand show radioactivity.

In sections 21,22,23,26,and 27, there are outcrops of granite as well as extrusives. On and around the granitic outcrops, free heavy concentrates can be seen on the surface of the outcrops and in the drainage courses leading away from the outcrops. Depressions scattered over this same area appear to be from six to ten feet deep and are filled with both granitic and volcanic overburden.

The overburden in the north half of section 28 and sections 20,29,30,and 31 is much deeper and is of finer texture. In this area, there is but one large wash as indicated on the map. Indications observed on the surface and in test holes show concentrations of radioactive black sands over this whole area . The volcanic or extrusive outcrop in the center of the north half of section 27 diverts the drainage from the east and northeast to the south at the present time. Heavy concentrates in the alluvium to the north of this hill suggest that alluvium from the northeast moved down from the northeast at one time, on the north side of the hill, through section 20.

On the basis of the evidence established up to the present time, an estimate of heavy concentrate ore reserves of a half million tons as a minimum can be made. Then if the results of the Lindsay Chemical Co. examination for monazite are used as an average , the minimum monazite content would be 5000tons. Of course, the success of any project to exploit these mineral reserves is dependent upon various factors such as the grade of the ore reserve in any specific area and the commercial value of zircon, ilmenite,etc., that might be recovered in the process to obtain the monazite. The more exact determination of ore reserves and their full commercial value must result from more complete exploration.

After considering the drainage of the area, the granitic outcrops, and the probable depth of the alluvium, we propose the following work to explore and establish more exact information about the ore reserves.

Docket DMEA No.2880
March 30.1953

1. 200 test holes, to be dug with Acker soil sampling tools and equipment along lines at right angles to the present drainage, and in rows designated on the map as A,B,C,D,E,and F.
   a. row A, 40 holes spaced about 200 feet apart
   b. row B, 40 holes spaced about 200 feet apart
   c. row C, 30 holes spaced about 200 feet apart excluding area of extrusive outcrop.
   d. rowDD, 30 holes as in row C
   e. row E, 30 holes as row C
   f. row F, 30 holes as row C
   (estimated depth of holes to average 20 feet)

2. Manual digging of holes and trenches in specific areas of sections 21,23,26,and 27.

3. Screening of weighed or measured samples

4. Hauling samples to concentration table

5. Concentrating heavy minerals on table

6. Drying and weighing heavy concentrate portion of samples

7. Disposition of samples for determination of relative mineral content

In conclusion, in as much as the composite sample examined by Lindsay Chemical Co. indicated the presence of monazite as the source of radioactivity in these heavy concentrates, we believe that we have reason to assume thatthe radioactivity from the"black sands" indicates the presence of monazite throughout the area wherein these concentrates have been exposed. The nature of the alluvium and its depth suggests that relatively large ore reserves can be established in the west half of the area and lessor reserves in the east half of the area. We believe that ore reserves can be established in such an amount that will warrant the proposed cost of further exploration. At the present time, I must add that I do not know the answers to the questions of how, where, and by whom, the samples of the heavy concentrates are to be analysed to the satisfaction of the Government.

I hope that this is added information adequate to your requirements but I shall be glad to answer further requests that might be necessary.

Sincerely yours,

Murry G. Espy

Murry G. Espy

4 enclosures

COPY C[illegible]Y

DINGS MAGNETIC SEPARATOR CO.

4740 W. Electric Ave.
Milwaukee, Wisconsin

June 17,1952

Testing Laboratory Report

Magnetic Separation Test No. 9018

Test made for Mr. Murry G. Espy
714 N. Seventh Avenue, Phoenix, Arizona
Material Tested-Black Sand Wt. in lbs.per cu. ft. around 175

Screen Analysis

					- %
Plus	20	Mesh			
Minus 20	Mesh	plus 65	Mesh		50.0
" 65	"	" 100	"		5.5
" 100	"	" 150	"		38.5
" 150	"	" 200	"		3.6
" 200					2.4
					100.0

TYPE OF SEPARATOR USED FOR TEST
High Intn. Cross-belt Separator Type EBK

Prod.	Wt.in Grams	%of Total Wt.			Gap	Amps
A	4900	72.1	Mag.Discharge from	1st Perma-plate	1-1/8"	-
B	471	6.9	" " "	2nd " "	1/4"	-
C	368	5.4	" " "	1st H.I. Pole	1/4"	2
D	128	1.9	" " "	2nd "	1/4"	3
E	64	0.9	" " "	3rd "	1/4"	5
F	103	1.5	" " "	4th "	1/4"	9
G	38	0.6	" " "	5th "	3/16"	9
H	17	0.3	" " "	6th "	1/8"	9
I	25	0.4	" " "	7th "	1/16"	9
J	65	0.9	" " "	8th "	1/16	12
K	42	0.6	" " "	9th "	1/16	12
L	22	0.3	" " "	10th "	1/16	12
M	557	8.2	Non Magnetic Discharge			
Total	6800	100.0				

Main Conveyor belt speed 40fpm
Burden thickness on main conveyor belt: Thickness of average size grain.

R. Tobert

COPY COPY

LINDSAY CHEMICAL COMPANY
West Chicago, Illinois

October 27, 1952

Mr. Harry Espy (correct name Murry)
714 N. Seventh Ave.
Phoenix, Arizona

Dear Mr. Espy:

This is in regard to samples from the Dings Magnetic Separator Co. Test No. 9018 which were received earlier this year and which we have just had a chance to complete.

We should like to mention that these samples were examined only for monozite with the following results: Sample A showed nil monazite, Samples B to F inclusive showed less than one percent each monazite, Sample G showed approximately 5% monazite, Sample H showed approximately 10% monazite, and Samples I to L inclusive showed approximately 20% monazite. The non magnetic tailings contained less than 5% monazite.

We do not know just what the significance of these results is since we do not have complete information on what your sample represents and how it was obtained.

Any information you can give us in this regard will be most appreciated.

Sincerely yours,

LINDSAY CHEMICAL COMPANY

Howard E. Kremers

Director of Research

Copy Copy

UNITED STATES
ATOMIC ENERGY COMMISSION

RMEM:MM:rq February 19.1951

Mr. Charles H. Dunning,Director
Department of Mineral Resources
Mineral Building,Fairgrounds
Phoenix, Arizona

Subject: SAMPLE FOR ANALYSIS; OUR REFERENCE NUMBER 4107A

Dear Mr. Dunning:

There follows our laboratory report on the sample of black sand which you gave me during my visit to Arizona last summer. This is the material in which it was suggested that the radio-activity may result from replacement of iron by uranium in hornblende.

The sample weighs about one and a half pounds and a split portion, ground through 100 mesh, shows 0.06% U308 equivalent. This radioactivity results principally from thorite. A very minor amount of the radioactivity results from allanite.

A rough estimate of the persentage of the constituent minerals follows:

	Percentage
Magnetite	75-80
Light minerals(feldspar,quartz, hornblende (?) biotite)	15
Ilmenite	5
Sphene	2-3
Allanite	0.4-0.5
Thorite	0.3-0.4
Fluorescent colorless zircon	0.2-0.3

The thorite occurs in euhedral crystals exhibiting a typical simple tetragonal form and ranging in color from tan through various shades of red and brown. The identity of the mineral has been verified by X-ray diffraction patterns which show also that the mineral is partially metamict.

The allanite exhibits a very minor amount of radioactivity, most of which probably results from small amounts of contained thorium. It occurs as simple,dark broan to black tabular crystals crystals,which in a cursory examination, might be mistaken for hornblende and it seems likely that this is the mineral referred to as the "hornblende in which uranium replaces iron". A few of the crystals show minor amounts

of alteration but in general the fragments are fresh. In transmitted light the allanite is anisotropic with moderate birefringence and exhibits strong pleochroism from green to shades of brown and frequently to nearly opaque in the larger fragments; the indices of refraction are between 1.75 and 1.78. The mineral yields an X-ray diffraction pattern which is in agreement with standard patterns for allanite.

Two radioactive concentrates were produced by a variety of laboratory techeniques dependent upon differences in specific gravity and magnetic permability. This treatment included fractionation in methylene iodide, followed by panning and separation on the Frantz isodynamic separator. The bulk of the radioactivity was confinced to the thorite fraction , which contained other than thorite, no radioactive mineral. The other radioactive fraction was composed almost entirely of allanite, but the radioactivity in this fraction was very minor in comparison to the thorite fraction . We feel certain , therefore, that the radioactivity in this sample results exclusively from thorite and allanite.

We appreciate your continued interest in the work of the Commission and if I can be of further help to you, please do not hesitate to call upon me. Enclosed you will find some documents that may be of interest to you.

Sincerely yours,

Robert D. Nininger
Deputy Asst. Manager

Enclosures:
1. U. Exploration in the U.S.
2. Press release 10/23/50
3. Uranium Procurement Policies
4. Assayers' Guide

COPY

Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

March 30, 1953

Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. 2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

In answer to your question stated in paragraph 2 of your letter of March 17, 1953, no chemical analysis of samples Ax,Bx,Cx,Dx, was made. The radioactivity of the samples was measured with a Geiger counter.

To supplement the information given in my letter of March 7 in paragraph 2, I might add that the sample of about two hundred pounds of heavy concentrates was a composite sample made up of material secured from the test holes dug during April and May. The approximate location of these holes were designated by red dots on the map of the claims. About one hundred pounds of this composite sample was sent to the Dings Magnetic Separator Company for separation and the thirteen separation products were examined for their monazite content by the Lindsay Chemical Company. (For the results see copies of reports enclosed herewith). The results do indicate the presence of monazite, however, they suggest that a different procedure for separation would be necessary, perhaps the use of both magnetic and electrostatic procedure. The location of the test holes from which the samples were taken to make up the composite sample and the measuring of each sample for radioactivity at least suggests but does not necessarily prove that radioactivity from each sample making up the composite sample come from a monazite content. This same suggestive conclusion applies to samples taken from test holes,Ax,Bx,Cx, and Dx.

I believe that a copy of the report on two samples examined by the Chemical and Physical Section, Metallurgical Division, Region IV, Bureau of Mines, Salt Lake City is included in the supporting papers of our application.

Radioactive black sands were first discovered on another group of claims south of the Black Magic group, in sections 3,4, and 5 of Township 3 north, Range 9 west, and known as the E.N. Greenleaf Enterprise group. A granitic ridge outcrops in the above-named sections and in this ridge pegmatite can be observed at several places. A sample of the black sand, first discovered, was given to the Dept. of Minerals Resources in Phoenix, who in turn gave the sample to a representative of the A.E.C., Herewith is a copy of his report of an examination of the sample as made by the A.E.C.

Until we learned of the monazite content in the heavy concentrates of the Black Magic group, we had assumed that the radioactivity come from allanite and thorite as reported for the sample from the E.N. Greenleaf group by the examination made by the A.E.C. Then further prospecting of the Black Magic group indicated that the black sands in that group apparently originated several miles to the north east of the E.N. Greenleaf group. The decision was made to make the two groups different projects.

Another map including the numbered sections in which are located the Black Magic claims is submitted. On this map, Tertiary volcanic outcrops are indicated roughly with red shading and the main drainage channels which flow to the southwest are indicated. Between these main channels are smaller contributing channels that are not indicated on the map. Heavy concentrates have been traced up all these main washes shown on the map in the observation of patches of black sand exposed on the surface of the alluvial material and apparent layers exposed in holes dug in the channels. With but very few exceptions these concentrates appearing as black sand show radioactivity.

In sections 21,22,23,26, and 27, there are outcrops of granite as well as extrusives. On and around the granitic outcrops, free heavy concentrates can be seen on the surface of the outcrops and in the drainage courses leading away from the outcrops. Depressions scattered over this same area appear to be from six to ten feet deep and are filled with both granitic and volcanic overburden.

The overburden in the north half of section 28 and sections 20,29,30, and 31 is much deeper and is of finer texture. In this area, there is but one large wash as indicated on the map. Indications observed on the surface and in test holes show concentrations of radioactive black sands over this whole area. The volcanic or extrusive outcrop in the center of the north half of section 27 diverts the drainage from the east and northeast to the south at the present time. Heavy concentrates in the alluvium to the north of this hill suggest that alluvium from the northeast moved down from the northeast at one time, on the north side of the hill, through section 20.

On the basis of the evidence established up to the present time, an estimate of heavy concentrate ore reserves of a half million tons as a minimum can be made. Then if the results of the Lindsay Chemical Co. examination for monazite are used as an average, the minimum monazite content would be 5,000 tons. Of course, the success of any project to exploit these mineral reserves is dependent upon various factors such as the grade of the ore reserve in any specific area and the commercial value of sircon, ilmenite, etc., that might be recovered in the process to obtain the monazite. The more exact determination of ore reserves and their full commercial value must result from more complete exploration.

After considering the drainage of the area, the granitic outcrops, and the probable depth of the alluvium, we propose the following work to explore and establish more exact information about the ore reserves.

1. 200 test holes, to be dug with Acker soil sampling tools and equipment along lines at right angles to the present drainage, and in rows designated on the map as A,B,C,D,E,and F.
   a. row A, 40 holes spaced about 200 feet apart
   b. row B, 40 holes spaced about 200 feet apart
   c. row C, 30 holes spaced about 200 feet apart excluding area of extrusive outcrop.
   d. row D, 30 holes as in row C
   e. row E, 30 holes as row C
   f. row F, 30 holes as row C
   (estimated depth of holes to average 20 feet)

2. Manual digging of holes and trenches in specific areas of sections 21,23,26,and 27.

3. Screening of weighed or measured samples

4. Hauling samples to concentration table

5. Concentrating heavy minerals on table

6. Drying and weighing heavy concentrate portion of samples

7. Disposition of samples for determination of relative mineral content

In conclusion, in as much as the composite sample examined by Lindsay Chemical Co. indicated the presence of monasite as the source of radioactivity in these heavy concentrates, we believe that we have reason to assume that the radioactivity from the "black sands" indicates the presence of monasite throughout the area wherein these concentrates have been exposed. The nature of the alluvium and its depth suggests that relatively large ore reserves can be established in the west half of the area and lessor reserves in the east half of the area. We believe that ore reserves can be established in such an amount that will warrant the proposed cost of further exploration. At the present time, I must add that I do not know the answers to the questions of how, where, and by whom, the samples of the heavy concentrates are to be analysed to the satisfaction of the Government.

I hope that this is added information adequate to your requirements but I shall be glad to answer further requests that might be necessary.

Sincerely yours,

(signed) MURRY G. ESPY
(typed) Murry G. Espy

4 enclosures

COPY COPY

DINGS MAGNETIC SEPARATOR CO.

4740 W. Electric Ave.
Milwaukee, Wisconsin

June 17, 1952

Testing Laboratory Report

Magnetic Separation Test No. 9018

Test made for Mr. Murry G. Espy
714 N. Seventh Avenue, Phoenix, Arizona
Material Tested-Black Sand Wt. in lbs. per cu. ft. around 175

Screen Analysis

Plus	20 Mesh		- %
Minus 20	Mesh plus 65	Mesh	50.0
" 65	" " 100	"	5.5
" 100	" " 150	"	38.5
" 150	" " 200	"	3.6
" 200			2.4
			100.0

TYPE OF SEPARATOR USED FOR TEST
High Intn. Cross-belt Separator Type MBK

Prod.	Wt. in Grams	% of Total Wt.		Gap	Amps
A	4900	72.1	Mag. Discharge from 1st Perma-plate	1-1/8"	-
B	471	6.9	" " " 2nd " "	1/4"	-
C	368	5.4	" " " 1st H.I. Pole	1/4"	2
D	128	1.9	" " " 2nd "	1/4"	3
E	64	0.9	" " " 3rd "	1/4"	5
F	103	1.5	" " " 4th "	1/4"	9
G	38	0.6	" " " 5th "	3/16"	9
H	17	0.3	" " " 6th "	1/8	9
I	25	0.4	" " " 7th "	1/16"	9
J	65	0.9	" " " 8th "	1/16	12
K	42	0.6	" " " 9th "	1/16	12
L	22	0.3	" " " 10th "	1/16	12
M	557	8.2	Non Magnetic Discharge		
Total	6800	100.0			

Main Conveyor belt speed 40 fpm
Burden thickness on main conveyor belt: Thickness of average size grain.

COPY

LINDSAY CHEMICAL COMPANY
West Chicago, Illinois

October 27, 1952

Mr. Harry Kapp (correct name Murry)
714 E. Seventh Ave.
Phoenix, Arizona

Dear Mr. Kapp:

This is in regard to samples from the Dinge Magnetic Separator Co. Test No. 9018 which were received earlier this year and which we have just had a chance to complete.

We should like to mention that these samples were examined only for monazite with the following results: Sample A showed nil monazite. Samples B to F inclusive showed less than one percent each monazite. Sample G showed approximately 5% monazite, Sample H showed approximately 10% monazite, and Samples I to L inclusive showed approximately 20% monazite. The non magnetic tailings contained less than 5% monazite.

We do not know just what the significance of these results is since we do not have complete information on what your sample represents and how it was obtained.

Any information you can give us in this regard will be most appreciated.

Sincerely yours,

LINDSAY CHEMICAL COMPANY

Howard E. Kremers

Director of Research

Copy Copy

UNITED STATES
ATOMIC ENERGY COMMISSION

EMEM:MR:rq February 19, 1951

Mr. Charles H. Dunning, Director
Department of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Arizona

Subject: SAMPLE FOR ANALYSIS; OUR REFERENCE NUMBER 4107A

Dear Mr. Dunning:

There follows our laboratory report on the sample of black sand which you gave me during my visit to Arizona last summer. This is the material in which it was suggested that the radio-activity may result from replacement of iron by uranium in hornblende.

The sample weighs about one and a half pounds and a split portion, ground through 100 mesh, shows 0.06% U3O8 equivalent. This radioactivity results principally from thorite. A very minor amount of the radioactivity results from allanite.

A rough estimate of the percentage of the constituent minerals follows:

	Percentage
Magnetite	75-80
Light minerals (feldspar, quartz, hornblende (?) biotite)	15
Ilmenite	5
Sphene	2-3
Allanite	0.4-0.5
Thorite	0.3-0.4
Fluorescent colorless zircon	0.2-0.3

The thorite occurs in euhedral crystals exhibiting a typical simple tetragonal form and ranging in color from tan through various shades of red and brown The identity of the mineral has been verified by X-ray diffraction patterns which show also that the mineral is partially metamict.

The allanite exhibits a very minor amount of radioactivity, most of which probably results from small amounts of contained thorium. It occurs as simple, dark brown to black tabular crystals, which in a cursory examination, might be mistaken for hornblende and it seems likely that this is the mineral referred to as the "hornblende in which uranium replaces iron". A few of the crystals show minor amounts

of alteration but in general the gragments are fresh. In transmitted light the allanite is anisotrophic with moderate birefringence and exhibits strong pleochroism from green to shades of brown and frequently to nearly opaque in the larger fragments; the indices of refraction are between 1.75 and 1.78. The mineral yields an X-ray diffraction pattern which is in agreement with standard patterns for allanite.

Two radioactive concentrates were produced by a variety of laboratory techniques dependent upon differences in specific gravity and magnetic permability. This treatment included fractionation in methylene iodide, followed by panning and separation on the Frantz isodynamic separator. The bulk of the radioactivity was confinced to the thorite fraction, which contained other than thorite, no radioactive mineral. The other radioactive fraction was composed almost entirely of allanite, but the radioactivity in this fraction was very minor in comparison to the thorite fraction. We feel certain, therefore, that the radioactivity in this sample results exclusively from thorite and allanite.

We appreciate your continued interest in the work of the Commission and if I can be of further help to you, please do not hesitate to call upon me. Enclosed you will find some documents that may be of interest to you.

Sincerely yours,

Robert D. Mininger
Deputy Asst. Manager

Enclosures:
1. U. Exploration in the U.S.
2. Press release 10/23/52
3. Uranium Procurement Policies
4. Assayers' Guide

COPY

Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

March 30, 1953

Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. 2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

In answer to your question stated in paragraph 2 of your letter of March 17, 1953, no chemical analysis of samples Ax,Bx,Cx,Dx, was made. The radioactivity of the samples was measured with a Geiger counter.

To supplement the information given in my letter of March 7 in paragraph 2, I might add that the sample of about two hundred pounds of heavy concentrates was a composite sample made up of material secured from the test holes dug during April and May. The approximate location of these holes were designated by red dots on the map of the claims. About one hundred pounds of this composite sample was sent to the Dings Magnetic Separator Company for separation and the thirteen separation products were examined for their monazite content by the Lindsay Chemical Company. (For the results see copies of reports enclosed herewith). The results do indicate the presence of monazite, however, they suggest that a different procedure for separation would be necessary, perhaps the use of both magnetic and electrostatic procedure. The location of the test holes from which the samples were taken to make up the composite sample and the measuring of each sample for radioactivity at least suggests but does not necessarily prove that radioactivity from each sample making up the composite sample come from a monazite content. This same suggestive conclusion applies to samples taken from test holes,Ax,Bx,Cx, and Dx.

I believe that a copy of the report on two samples examined by the Chemical and Physical Section, Metallurgical Division, Region IV, Bureau of Mines, Salt Lake City is included in the supporting papers of our application.

Radioactive black sands were first discovered on another group of claims south of the Black Magic group, in sections 3,4, and 5 of Township 3 north, Range 9 west, and known as the N.N. Greenleaf Enterprise group. A granitic ridge outcrops in the above-named sections and in this ridge pegmatite can be observed at several places. A sample of the black sand, first discovered, was given to the Dept. of Minerals Resources in Phoenix, who in turn gave the sample to a representative of the A.E.C., Herewith is a copy of his report of an examination of the sample as made by the A.E.C.

Until we learned of the monazite content in the heavy concentrates of the Black Magic group, we had assumed that the radioactivity come from allanite and thorite as reported for the sample from the E.N. Greenleaf group by the examination made by the A.E.C. Then further prospecting of the Black Magic group indicated that the black sands in that group apparently originated several miles to the north east of the E.N. Greenleaf group. The decision was made to make the two groups different projects.

Another map including the numbered sections in which are located the Black Magic claims is submitted. On this map, Tertiary volcanic outcrops are indicated roughly with red shading and the main drainage channels which flow to the southwest are indicated. Between these main channels are smaller contributing channels that are not indicated on the map. Heavy concentrates have been traced up all these main washes shown on the map in the observation of patches of black sand exposed on the surface of the alluvial material and apparent layers exposed in holes dug in the channels. With but very few exceptions these concentrates appearing as black sand show radioactivity.

In sections 21,22,23,26, and 27, there are outcrops of granite as well as extrusives. On and around the granitic outcrops, free heavy concentrates can be seen on the surface of the outcrops and in the drainage courses leading away from the outcrops. Depressions scattered over this same area appear to be from six to ten feet deep and are filled with both granitic and volcanic overburden.

The overburden in the north half of section 28 and sections 20,29,30, and 31 is much deeper and is of finer texture. In this area, there is but one large wash as indicated on the map. Indications observed on the surface and in test holes show concentrations of radioactive black sands over this whole area. The volcanic or extrusive outcrop in the center of the north half of section 27 diverts the drainage from the east and northeast to the south at the present time. Heavy concentrates in the alluvium to the north of this hill suggest that alluvium from the northeast moved down from the northeast at one time, on the north side of the hill, through section 20.

On the basis of the evidence established up to the present time, an estimate of heavy concentrate ore reserves of a half million tons as a minimum can be made. Then if the results of the Lindsay Chemical Co. examination for monazite are used as an average, the minimum monazite content would be 5,000 tons. Of course, the success of any project to exploit these mineral reserves is dependent upon various factors such as the grade of the ore reserve in any specific area and the commercial value of zircon, ilmenite, etc., that might be recovered in the process to obtain the monazite. The more exact determination of ore reserves and their full commercial value must result from more complete exploration.

After considering the drainage of the area, the granitic outcrops, and the probable depth of the alluvium, we propose the following work to explore and establish more exact information about the ore reserves.

1. 200 test holes, to be dug with Acker soil sampling tools and equipment along lines at right angles to the present drainage, and in rows designated on the map as A,B,C,D,E,and F.
   a. row A, 40 holes spaced about 200 feet apart
   b. row B, 40 holes spaced about 200 feet apart
   c. row C, 30 holes spaced about 200 feet apart excluding area of extrusive outcrop.
   d. row D, 30 holes as in row C
   e. row E, 30 holes as row C
   f. row F, 30 holes as row C
   (estimated depth of holes to average 20 feet)

2. Manual digging of holes and trenches in specific areas of sections 21,23,26,and 27.

3. Screening of weighed or measured samples

4. Hauling samples to concentration table

5. Concentrating heavy minerals on table

6. Drying and weighing heavy concentrate portion of samples

7. Disposition of samples for determination of relative mineral content

In conclusion, in as much as the composite sample examined by Lindsay Chemical Co. indicated the presence of monazite as the source of radioactivity in these heavy concentrates, we believe that we have reason to assume that the radioactivity from the "black sands" indicates the presence of monazite throughout the area wherein these concentrates have been exposed. The nature of the alluvium and its depth suggests that relatively large ore reserves can be established in the west half of the area and lesser reserves in the east half of the area. We believe that ore reserves can be established in such an amount that will warrant the proposed cost of further exploration. At the present time, I must add that I do not know the answers to the questions of how, where, and by whom, the samples of the heavy concentrates are to be analyzed to the satisfaction of the Government.

I hope that this is added information adequate to your requirements but I shall be glad to answer further requests that might be necessary.

Sincerely yours,

(signed) MURRY G. ESPY
(typed) Murry G. Espy

4 enclosures

COPY COPY

DINGS MAGNETIC SEPARATOR CO.

4740 W. Electric Ave.
Milwaukee, Wisconsin

June 17, 1952

Testing Laboratory Report

Magnetic Separation Test No. 9018

Test made for Mr. Kurry G. Espy
714 E. Seventh Avenue, Phoenix, Arizona
Material Tested-Black Sand Wt. in lbs. per cu. ft. around 175

Screen Analysis

		- %
Plus	20 Mesh	
Minus 20	Mesh plus 65 Mesh	50.0
" 65	" " 100 "	5.5
" 100	" " 150 "	38.5
" 150	" " 200 "	3.6
" 200		2.4
		100.0

TYPE OF SEPARATOR USED FOR TEST
High Intn. Cross-belt Separator Type HSK

Prod.	Wt. in Grams	% of Total Wt.		Gap	Amps
A	4900	72.1	Mag. Discharge from 1st Ferma-plate	1-1/8"	-
B	471	6.9	" " " 2nd " "	1/4"	-
C	368	5.4	" " " 1st H.I. Pole	1/4"	2
D	128	1.9	" " " 2nd "	1/4"	3
E	64	0.9	" " " 3rd "	1/4"	5
F	103	1.5	" " " 4th "	1/4"	9
G	38	0.6	" " " 5th "	3/16"	9
H	17	0.3	" " " 6th "	1/8	9
I	25	0.4	" " " 7th "	1/16"	9
J	65	0.9	" " " 8th "	1/16	12
K	42	0.6	" " " 9th "	1/16	12
L	22	0.3	" " " 10th "	1/16	12
M	557	8.2	Non Magnetic Discharge		
Total	6800	100.0			

Main Conveyor belt speed 40 fpm
Burden thickness on main conveyor belt: Thickness of average size grain.

COPY

LINDSAY CHEMICAL COMPANY
West Chicago, Illinois

October 27, 1952

Mr. Harry Espy (correct name Murry)
714 N. Seventh Ave.
Phoenix, Arizona

Dear Mr. Espy:

This is in regard to samples from the Dings Magnetic Separator Co. Test No. 9018 which were received earlier this year and which we have just had a chance to complete.

We should like to mention that these samples were examined only for monozite with the following results: Sample A showed nil monazite, Samples B to F inclusive showed less than one percent each monazite, Sample G showed approximately 5% monazite, Sample H showed approximately 10% monazite, and Samples I to L inclusive showed approximately 20% monazite. The non magnetic tailings contained less than 5% monazite.

We do not know just what the significance of these results is since we do not have complete information on what your sample represents and how it was obtained.

Any information you can give us in this regard will be most appreciated.

Sincerely yours,

LINDSAY CHEMICAL COMPANY

Howard E. Kremers

Director of Research

Copy Copy

UNITED STATES
ATOMIC ENERGY COMMISSION

DLE:MM:rq February 19, 1951

Mr. Charles H. Dunning, Director
Department of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Arizona

Subject: SAMPLE FOR ANALYSIS; OUR REFERENCE NUMBER 4107A

Dear Mr. Dunning:

There follows our laboratory report on the sample of black sand which you gave me during my visit to Arizona last summer. This is the material in which it was suggested that the radio-activity may result from replacement of iron by uranium in hornblende.

The sample weighs about one and a half pounds and a split portion, ground through 100 mesh, shows 0.06% U_3O_8 equivalent. This radioactivity results principally from thorite. A very minor amount of the radioactivity results from allanite.

A rough estimate of the percentage of the constituent minerals follows:

	Percentage
Magnetite	75-80
Light minerals (feldspar, quartz, hornblende (?) biotite)	15
Ilmenite	5
Sphene	2-3
Allanite	0.4-0.5
Thorite	0.3-0.4
Fluorescent colorless zircon	0.2-0.3

The thorite occurs in euhedral crystals exhibiting a typical simple tetragonal form and ranging in color from tan through various shades of red and brown The identity of the mineral has been verified by X-ray diffraction patterns which show also that the mineral is partially metamict.

The allanite exhibits a very minor amount of radioactivity, most of which probably results from small amounts of contained thorium. It occurs as simple, dark brown to black tabular crystals, which in a cursory examination, might be mistaken for hornblende and it seems likely that this is the mineral referred to as the "hornblende in which uranium replaces iron". A few of the crystals show minor amounts

of alteration but in general the gragments are fresh. In transmitted light the allanite is anisotrophic with moderate birefringence and exhibits strong pleochroism from green to shades of brown and frequently to nearly opaque in the larger fragments; the indices of refraction are between 1.75 and 1.78. The mineral yields an X-ray diffraction pattern which is in agreement with standard patterns for allanite.

Two radioactive concentrates were produced by a variety of laboratory techniques dependent upon differences in specific gravity and magnetic permability. This treatment included fractionation in methylene iodide, followed by panning and separation on the Frants isodynamic separator. The bulk of the radioactivity was confinced to the thorite fraction, which contained other than thorite, no radioactive mineral. The other radioactive fraction was composed almost entirely of allanite, but the radioactivity in this fraction was very minor in comparison to the thorite fraction. We feel certain, therefore, that the radioactivity in this sample results exclusively from thorite and allanite.

We appreciate your continued interest in the work of the Commission and if I can be of further help to you, please do not hesitate to call upon me. Enclosed you will find some documents that may be of interest to you.

Sincerely yours,

Robert D. Mininger
Deputy Asst. Manager

Enclosures:
1. U. Exploration in the U.S.
2. Press release 10/23/52
3. Uranium Procurement Policies
4. Assayers' Guide

COPY

Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

March 30, 1953

Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. 2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

In answer to your question stated in paragraph 2 of your letter of March 17, 1953, no chemical analysis of samples Ax,Bx,Cx,Dx, was made. The radioactivity of the samples was measured with a Geiger counter.

To supplement the information given in my letter of March 7 in paragraph 2, I might add that the sample of about two hundred pounds of heavy concentrates was a composite sample made up of material secured from the test holes dug during April and May. The approximate location of these holes were designated by red dots on the map of the claims. About one hundred pounds of this composite sample was sent to the Dings Magnetic Separator Company for separation and the thirteen separation products were examined for their monazite content by the Lindsay Chemical Company. (For the results see copies of reports enclosed herewith). The results do indicate the presence of monazite, however, they suggest that a different procedure for separation would be necessary, perhaps the use of both magnetic and electrostatic procedure. The location of the test holes from which the samples were taken to make up the composite sample and the measuring of each sample for radioactivity at least suggests but does not necessarily prove that radioactivity from each sample making up the composite sample come from a monazite content. This same suggestive conclusion applies to samples taken from test holes,Ax,Bx,Cx, and Dx.

I believe that a copy of the report on two samples examined by the Chemical and Physical Section, Metallurgical Division, Region IV, Bureau of Mines, Salt Lake City is included in the supporting papers of our application.

Radioactive black sands were first discovered on another group of claims south of the Black Magic group, in sections 3,4, and 5 of Township 3 north, Range 9 west, and known as the E.N. Greenleaf Enterprise group. A granitic ridge outcrops in the above-named sections and in this ridge pegmatite can be observed at several places. A sample of the black sand, first discovered, was given to the Dept. of Minerals Resources in Phoenix, who in turn gave the sample to a representative of the A.E.C., Herewith is a copy of his report of an examination of the sample as made by the A.E.C.

Until we learned of the monazite content in the heavy concentrates of the Black Magic group, we had assumed that the radioactivity come from allanite and thorite as reported for the sample from the E.N. Greenleaf group by the examination made by the A.E.C. Then further prospecting of the Black Magic group indicated that the black sands in that group apparently originated several miles to the north east of the E.N. Greenleaf group. The decision was made to make the two groups different projects.

Another map including the numbered sections in which are located the Black Magic claims is submitted. On this map, Tertiary volcanic outcrops are indicated roughly with red shading and the main drainage channels which flow to the southwest are indicated. Between these main channels are smaller contributing channels that are not indicated on the map. Heavy concentrates have been traced up all these main washes shown on the map in the observation of patches of black sand exposed on the surface of the alluvial material and apparent layers exposed in holes dug in the channels. With but very few exceptions these concentrates appearing as black sand show radioactivity.

In sections 21,22,23,26, and 27, there are outcrops of granite as well as extrusives. On and around the granitic outcrops, free heavy concentrates can be seen on the surface of the outcrops and in the drainage courses leading away from the outcrops. Depressions scattered over this same area appear to be from six to ten feet deep and are filled with both granitic and volcanic overburden.

The overburden in the north half of section 28 and sections 20,29,30, and 31 is much deeper and is of finer texture. In this area, there is but one large wash as indicated on the map. Indications observed on the surface and in test holes show concentrations of radioactive black sands over this whole area. The volcanic or extrusive outcrop in the center of the north half of section 27 diverts the drainage from the east and northeast to the south at the present time. Heavy concentrates in the alluvium to the north of this hill suggest that alluvium from the northeast moved down from the northeast at one time, on the north side of the hill, through section 20.

On the basis of the evidence established up to the present time, an estimate of heavy concentrate ore reserves of a half million tons as a minimum can be made. Then if the results of the Lindsay Chemical Co. examination for monazite are used as an average, the minimum monazite content would be 5,000 tons. Of course, the success of any project to exploit these mineral reserves is dependent upon various factors such as the grade of the ore reserve in any specific area and the commercial value of zircon, ilmenite, etc., that might be recovered in the process to obtain the monazite. The more exact determination of ore reserves and their full commercial value must result from more complete exploration.

After considering the drainage of the area, the granitic outcrops, and the probable depth of the alluvium, we propose the following work to explore and establish more exact information about the ore reserves.

1. 200 test holes, to be dug with Acker soil sampling tools and equipment along lines at right angles to the present drainage, and in rows designated on the map as A,B,C,D,E,and F.
   a. row A, 40 holes spaced about 200 feet apart
   b. row B, 40 holes spaced about 200 feet apart
   c. row C, 30 holes spaced about 200 feet apart excluding area of extrusive outcrop.
   d. row D, 30 holes as in row C
   e. row E, 30 holes as row C
   f. row F, 30 holes as row C
   (estimated depth of holes to average 20 feet)

2. Manual digging of holes and trenches in specific areas of sections 21,23,26,and 27.

3. Screening of weighed or measured samples

4. Hauling samples to concentration table

5. Concentrating heavy minerals on table

6. Drying and weighing heavy concentrate portion of samples

7. Disposition of samples for determination of relative mineral content

In conclusion, in as much as the composite sample examined by Lindsay Chemical Co. indicated the presence of monazite as the source of radioactivity in these heavy concentrates, we believe that we have reason to assume that the radioactivity from the "black sands" indicates the presence of monazite throughout the area wherein these concentrates have been exposed. The nature of the alluvium and its depth suggests that relatively large ore reserves can be established in the west half of the area and lessor reserves in the east half of the area. We believe that ore reserves can be established in such an amount that will warrant the proposed cost of further exploration. At the present time, I must add that I do not know the answers to the questions of how, where, and by whom, the samples of the heavy concentrates are to be analysed to the satisfaction of the Government.

I hope that this is added information adequate to your requirements but I shall be glad to answer further requests that might be necessary.

Sincerely yours,

(signed) MURRY G. ESPY
(typed) Murry G. Espy

4 enclosures

COPY COPY

DINGS MAGNETIC SEPARATOR CO.

4740 W. Electric Ave.
Milwaukee, Wisconsin

June 17, 1952

Testing Laboratory Report

Magnetic Separation Test No. 9018

Test made for Mr. Murry G. Espy
714 N. Seventh Avenue, Phoenix, Arizona
Material Tested-Black Sand Wt. in lbs. per cu. ft. around 175

Screen Analysis

					- %
Plus	20 Mesh				
Minus 20	Mesh plus	65	Mesh		50.0
" 65	" "	100	"		5.5
" 100	" "	150	"		38.5
" 150	" "	200	"		3.6
" 200					2.4
					100.0

TYPE OF SEPARATOR USED FOR TEST
High Intn. Cross-belt Separator Type EBK

Prod.	Wt. in Grams	% of Total Wt.		Gap	Amps
A	4900	72.1	Mag. Discharge from 1st Perma-plate	1-1/8"	-
B	471	6.9	" " " 2nd " "	1/4"	-
C	368	5.4	" " " 1st H.I. Pole	1/4"	2
D	128	1.9	" " " 2nd "	1/4"	3
E	64	0.9	" " " 3rd "	1/4"	5
F	103	1.5	" " " 4th "	1/4"	9
G	38	0.6	" " " 5th "	3/16"	9
H	17	0.3	" " " 6th "	1/8	9
I	25	0.4	" " " 7th "	1/16"	9
J	65	0.9	" " " 8th "	1/16	12
K	42	0.6	" " " 9th "	1/16	12
L	22	0.3	" " " 10th "	1/16	12
M	557	8.2	Non Magnetic Discharge		
Total	6800	100.0			

Main Conveyor belt speed 40 fpm
Burden thickness on main conveyor belt: Thickness of average size grain.

COPY

LINDSAY CHEMICAL COMPANY
West Chicago, Illinois

October 27, 1952

Mr. Harry Zapp (correct name Murray)
714 N. Seventh Ave.
Phoenix, Arizona

Dear Mr. Zapp:

This is in regard to samples from the Dings Magnetic Separator Co. Test No. 9018 which were received earlier this year and which we have just had a chance to complete.

We should like to mention that these samples were examined only for monosite with the following results: Sample A showed nil monazite, Samples B to F inclusive showed less than one percent each monazite, Sample G showed approximately 5% monazite, Sample H showed approximately 10% monazite, and Samples I to L inclusive showed approximately 20% monazite. The non magnetic tailings contained less than 5% monazite.

We do not know just what the significance of these results is since we do not have complete information on what your sample represents and how it was obtained.

Any information you can give us in this regard will be most appreciated.

Sincerely yours,

LINDSAY CHEMICAL COMPANY

Howard E. Kremers

Director of Research

Copy Copy

UNITED STATES
ATOMIC ENERGY COMMISSION

RMEM:MM:rq February 19, 1951

Mr. Charles H. Dunning, Director
Department of Mineral Resources
Mineral Building, Fairgrounds
Phoenix, Arizona

Subject: SAMPLE FOR ANALYSIS; OUR REFERENCE NUMBER 4107A

Dear Mr. Dunning:

There follows our laboratory report on the sample of black sand which you gave me during my visit to Arizona last summer. This is the material in which it was suggested that the radio-activity may result from replacement of iron by uranium in hornblende.

The sample weighs about one and a half pounds and a split portion, ground through 100 mesh, shows 0.06% U3O8 equivalent. This radioactivity results principally from thorite. A very minor amount of the radioactivity results from allanite.

A rough estimate of the percentage of the constituent minerals follows:

	Percentage
Magnetite	75-80
Light minerals (feldspar, quartz, hornblende (?) biotite)	15
Ilmenite	5
Sphene	2-3
Allanite	0.4-0.5
Thorite	0.3-0.4
Fluorescent colorless sircon	0.2-0.3

The thorite occurs in euhedral crystals exhibiting a typical simple tetragonal form and ranging in color from tan through various shades of red and brown The identity of the mineral has been verified by X-ray diffraction patterns which show also that the mineral is partially metamict.

The allanite exhibits a very minor amount of radioactivity, most of which probably results from small amounts of contained thorium. It occurs as simple, dark broan to black tabular crystals, which in a cursory examination, might be mistaken for hornblende and it seems likely that this is the mineral referred to as the "hornblende in which uranium replaces iron". A few of the crystals show minor amounts

of alteration but in general the gragments are fresh. In transmitted light the allanite is anisotrophic with moderate birefringence and exhibits strong pleochroism from green to shades of brown and frequently to nearly opaque in the larger fragments; the indices of refraction are between 1.75 and 1.78. The mineral yields an X-ray diffraction pattern which is in agreement with standard patterns for allanite.

Two radioactive concentrates were produced by a variety of laboratory techniques dependent upon differences in specific gravity and magnetic permability. This treatment included fractionation in methylene iodide, followed by panning and separation on the Frantz isodynamic separator. The bulk of the radioactivity was confinced to the thorite fraction, which contained other than thorite, no radioactive mineral. The other radioactive fraction was composed almost entirely of allanite, but the radioactivity in this fraction was very minor in comparison to the thorite fraction. We feel certain, therefore, that the radioactivity in this sample results exclusively from thorite and allanite.

We appreciate your continued interest in the work of the Commission and if I can be of further help to you, please do not hesitate to call upon me. Enclosed you will find some documents that may be of interest to you.

Sincerely yours,

Robert D. Nininger
Deputy Asst. Manager

Enclosures:
1. U. Exploration in the U.S.
2. Press release 10/23/52
3. Uranium Procurement Policies
4. Assayers' Guide

700
FILE COPY
SURNAME:

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

F.L. Knouse
Attention

Mr. Harry O. Espy, General Partner
Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

MAR 17 1953

Re: Docket No. DMEA-2660
(Monazite and Rare Earth Minerals)
Black Magic Placer Claim
Maricopa County, Arizona

J. C. 3/17/53

Dear Mr. Espy:

This acknowledges receipt of a property map and your letters with attachments, dated March 2 and March 7, 1953, in reply to our request of March 24, 1953, for additional information.

In your letter of March 7, we note four test holes were dug designated as AX, BX, CX and DX from which there was recovered from the respective test-hole samples, 2.55%, 10.00%, 8.00% and 16.00% of heavy concentrate. Also that the radioactivity of the heavy concentrate samples was determined by means of a geiger counter. Do you have a chemical analysis of the heavy concentrate samples recovered from the test pits which indicates the presence of monazite or rare earth minerals?

In addition to the information supplied by you, so that we can continue to process your application, we will require information illustrating the presence of encouraging indications of monazite or rare earth minerals on your property, the location of where these minerals were found, and a map showing the proposed work as justification for the project. The map you submitted did not show the location of the proposed exploration work.

As soon as we receive this information we will continue the processing of your application.

Sincerely yours,

SIGNED

Ernest W. Ellis, Chief
Rare and Misc. Metals Division

FLKnouse/jem/gla
3-16-53
cc to: Adm. Reading File
Docket
Messrs. EJCarlson-3649
JJNorton-G-232 GSA
Ellis Knouse
PT Region IV (2)

3/11/53 gla

BLACK MAGIC MINING ASSOCIATION
714 N. Seventh Avenue
Phoenix, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 1 1 1953

March 7, 1953

Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No.DMEA-2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

Further in compliance with your request of Feburary 24, 1953, I am sending herewith a map on which ~~are~~ is indicated the location of test holes from which samples have been taken to show the heavy concentrate ratio in the placer material.

During April and May of last year, we took samples from test holes which are indicated on the map with red dots. We dug the holes and then took our samples from vertical channels cut in the sides of the holes. At that time we had no equipment in the field to weigh the samples so we used a bucket in which to gather the samples. We had taken alluvial material to where it could be weighed and determined that this bucket held very close to fifty pounds of placer material. At the same time we used a smaller can for measuring the heavy concentrates and determined an average weight for several samples. At that time we were interested in sending away about two hundred pounds of the concentrates for separation and rough analysis. In using the bucket and the smaller can we roughly estimated that the ratio of heavy concentrates recovered from these samples was never less than 2% and sometimes considerably more. Heavy rains in August and September obliterated all these test holes.

During last October we dug the test holes designated Ax,Bx,Cx, and Dx. Again we took our samples by cutting vertical channels in the walls of the holes. However this time we used scales to weigh the sample and the heavy concentrates recovered from the sample. The percentage of heavy concentrates were

Ax.	2.25%
Bx.	10.00%
Cx.	8.00%
D x.	16.00%

It is not amiss to point out that our objective during the earlier work was to detect the presence of radio active material and that at that time we considered rough estimates of total heavy concentrates adequate for purpose of discovery.

re: DocketNo. DMEA-2880

On the map the main outcrops of volcanic rocks are indicated by red color and the granitic outcrops as well as alluvium derived from the granitic outcrops are indicated by gray coloring. Within the granitic area there are minor volcanic dikes that are not indicated on the map. As indicated on the map the drainage for the area is from the north east to the south west. When looking over the area from a point several hundred feet higher than the area, the surface within the brown lines has a deeper red coloring than the adjoining area. Then when walking over this same surface it can be seen that the alluvium is deeper and here and there old drainage channelscan be seen. The lighter colored surface is bare granite or a thin covering of alluvium resting on granitic rock. In Sections 13 and 24 there are indications of heavy concentrates separating out of the granitic mass outcrop, the same indications can be seen in Sections 14 and 15 but in a lessor degree.

After considering the results from digging the test holes and the geologic features of the area, we propose to put down test holes along ten lines at right angles to the direction of the drainage. The volcanic outcrops encountered along these lineswill determine the spacing of the holes along each line. We consider the scrutiny or surveying along these lines as part of the exploratory project. As a consequence the exact spacing of the test holes is yet to be determined but we believe that 40,000 feet of test holes as expressed in 200 holes of average depth of 20 feet will tell the story. These ten lines would be located as indicated by the diagonal pencil lines on the map.

The test holes show that the heavy concentrates accumulate in layers at different depths in the holes for the most part. A few holes indicated that the heavy concentrates were disseminated throughout the alluvium, and even if they were accumulated in layers there was also dissemination not easily observed. The heavy concentrates were separated out of the alluvium in gold pans by careful panning. Radio activity of the samples was tested with Geiger counters.

Sincerely yours,

Murry G. Espy

Murry G. Espy

3/11/53 gla

BLACK MAGIC MINING ASSOCIATION
714 N. Seventh Avenue
Phoenix, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 4 1953

March 2, 1953

Ernest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No.DMEA-2880
(Monazite & Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

In compliance with your request of February 24, 1953, I am enclosing herewith a copy of the Certificate of Limited Partnership for the Black Magic Mining Association.

In formulating this partnership agreement our purpose was to embody provisions that would meet requirements that might be necessaryb to contract with the Government for DMEA aid. We assume that the group location of placer claims comprising 160 acres implies partnership. Further, we believe that this limited partnership agreement would offer a practical way to enter into and complete a contract for DMEA aid in the exploration project.

Kindly advise me if our partnership agreement is sufficient to meet the requirement of the Government or if signed Forms MF-203 "Owner's Consent to Lien" will be necessary.

The data necessary to complete maps or sketches to supply the information concerning test pits is filed out in the field. In the next five days, I shall mail this information to you.

Sincerely yours,

Murry G. Espy

Murry G. Espy

BLACK MAGIC MINING ASSOCIATION
714 N. Seventh Avenue
Phoenix, Arizona

COPY

March 7, 1953

Earnest Wm. Ellis, Chief
Rare and Misc. Metals Division
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. DMEA-2880
(Monazite and Rare Earth Minerals)
Black Magic Placer Claims
Maricopa County, Arizona

Dear Mr. Ellis:

Further in compliance with your request of Feburary 24, 1953, I am sending herewith a map on which is indicated the location of test holes from which samples have been taken to show the heavy concentrate ratio in the placer material.

During April and May of last year, we took samples from test holes which are indicated on the map with red dots. We dug the holes and then took our samples from vertical channels cut in the sides of the holes. At that time we had no equipment in the field to weigh the samples so we used a bucket in which to gather the samples. We had taken alluvial material to where it could be weighed and determined that this bucket held very close to fifty pounds of placer material. At the same time we used a smaller can for measuring the heavy concentrates and determined an average weight for several samples. At that time we were interested in sending away about two hundred pounds of the concentrates for seperation and rough analysis. In using the bucket and the smaller can we roughly estimated that the ratio of heavy concentrates recovered from these samples was never less than 2% and sometines considerably more. Heavy rains in August and September obliterated all these test holes.

During last October we dug the test holes designated Ax, Bx, Cx, and Dx. Again we took our samples by cutting vertical channels in the walls of the holes. However this time we used scales to weigh the sample and the heavy concentrates recovered from the sample. The percentage of heavy concentrates were

Ax.	2.25%
Bx.	10.00%
Cx.	8.00%
Dx.	16.00%

It is not amiss to point out that our objective during the earlier work was to detect the presence of radio active material and that at that time we considered rough estimates of total heavy concentrates adequate for purpose of discovery.

COPY

Re: Docket No. DMEA-2880

On the map the main outcrops of volcanic rocks are indicated by red color and the granitic outcrops as well as alluvium derived from the granitic outcrops are indicated by gray coloring. Within the granitic area there are minor volocanic dikes that are not indicated on the map. As indicated on the map the drainage for the area is from the north east to the south west. When looking over the area from a point several hundred feet higher than the area, the surface within the brown lines has a deeper red coloring than the adjoining area. Then when walking over this same surface it can be seen that the alluvium is deeper and here and there old drainage channels can be seen. The lighter colored surface is bare granite or a thin covering of Alluvium resting on granitic rock. In Sections 13. and 24 there are indications of heavy concentrates separating out of the granitic mass outcrop, the same indications can be seen in Section 14 and 15 but in a lessor degree.

After considering the results from digging the test holes and the geologic features of the area, we propose to put down test holes along ten lines at right angles to the direction of the drainage. The volcanic outcrops encountered along these lines will determine the spacing of the holes along each line. We consider the scrutiny or surveying along these lines as part of the exploratory project. As a consequence the exact spacing of the test holes is yet to be determined but we believe that 40,000 feet of test holes as expressed in 200 holes of average depth of 20 feet will tell the story. These ten lines would be located as indicated by the diagonal pencil lines on the map.

The test holes show that the heavy concentrates accumulate in layers at different depths in the holes for the most part. A few holes indicated that the heavy concentrates were disseminated throughout the alluvium, and even if they were accumulated in layers there was also dissemination not easily observed. The heavy concentrates were seperated out of the alluvium in gold pans by careful panning. Radio activity of the samples was tested with Geiger counters.

Sincerely yours

(Signed) Murry G. Espy

Murry G. Espy

CERTIFICATE OF LIMITED PARTNERSHIP

This AGREEMENT made January 29,1953, between the locators of the BLACK MAGIC PLACER MINING CLAIMS who joined together to locate placer mining claims of 160 acres of land in each claim and with each claim having a colocator for one eighth or 20 acres in each group claim of 160 acres, is for the purpose of exploring the claims to determine the extent of the ore reserves, within the BLACK MAGIC PLACER MINING CLAIMS.

WITNESSETH:

1. The name of the LIMITED PARTNERSHIP shall be the BLACK MAGIC MINING ASSOCIATION.

2. The business of the partnership shall be to carry out an exploration project to establish ore reserves and their monetary value.

3. The principal place of business for the exploratory operations shall be within Townships 3 and 4 North, Range 9 West, G&SRBM, in Maricopa County, State of Arizona. The general partners shall designate a post office address for the BLACK MAGIC MINING ASSOCIATION.

4. For and in behalf of the BLACK MAGIC MINING ASSOCIATION, one, or both of the GENERAL PARTNERS, shall file an application for aid in an EXPLORATION PROJECT to explore the BLACK MAGIC PLACER MINING CLAIMS with the DEFENSE MINERALS EXPLORATION ADMINISTRATION ; and further if the application is approved by the DMEA, sign and enter into an EXPLORATION PROJECT CONTRACT such as is set forth in DMEA Order No.1.
The GENERAL PARTNERS shall carry out the terms of the EXPLORATION PROJECT CONTRACT and in so doing shall make and be responsible for only financial obligations and expenditures in behalf of the BLA CK MAGIC MINING ASSOCIATION as can be considered to be "allowable costs" as designated in DMEA Order No.1.
The GENERAL PARTNERS shall be compensated for labor and services as designated in the application and contract as approved by the DMEA.
The GENERAL PARTNERS can delegate performance of labor and service to LIMITED PARTNERS or others. Compensation for such labor and services shall be designated in the application and contract for aid as approved by the DMEA.
Each PARTNER in his or her contribution to the BLA CK MAGIC MINING ASSOCIATION agrees thereby to grant a lien to the Government upon his interest in the BLA CK MAGIC PLACER MINING CLAIMS to secure the payment of its royalties on production in the manner to be designated in the EXPLORATION PROJECT CONTRACT.

Certificate of Limited Partenrship (cont.)

5. GENERAL PARTNERS in the BLACK MAGIC MINING ASSOCIATION are

John L. Holt
Salome, Arizona

Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

LIMITED PARTNERS in the BLACK MAGIC MINING ASSOCIATION are

Viola W. Holt
Salome, Arizona

Ruby B. Espy
714 N. Seventh Avenue
Phoenix, Arizona

Lucille Woodward
4529 N. Halifax Road
El Monte, California

C. L. Espy Jr.
307 E. Cowden Street
Midland, Texas

Archie Babb
Box 2
Colfax, Washington

Ernest C. Kneale
801 N. Sixth Avenue
Phoenix, Arizona

Certificate of Partnership (cont.)

6. The term for which this LIMITED PARTNERSHIP AGREEMENT is to exist shall be for the period of time necessary to complete the exploratory work to be done in compliance with the EXPLORATION PROJECT CONTRACT designated in paragraph 4 of this AGREEMENT and a CERTIFICATE OF DISCOVERY OR DEVELOPMENT is issued, or until such time that the Government might terminate the CONTRACT. Each Partner agrees that in the event of his withdrawal from the PARTNERSHIP due from whatever cause, his or her assigns, heirs, guardians, administrators, executors, or successors will be bound by this agreement and this agreement can be amended to substitute the signature of his or her successor.

7. In the event that a CERTIFICATE OF DISCOVERY OR DEVELOPMENT is issued to the BLACK MAGIC MINING ASSOCIATION this CERTIFICATE OF LIMITED PARTNERSHIP shall be amended to provide for mining operations or for other purposes that would be advantageous in the exploitation of the BLAWK MAGIC PLACER MINING CLAIMS and any lode claims located in the name of the BLACK MAGIC MINING ASSOCIATION. Any amended Certificate of Partnership shall in no manner contravene or conflict with the provisions of the EXPLORATION PROJECT CONTRACT.

8. Each GENERAL and LIMITED PARTNER shall contribute his or her ownership in all group claims of which he or she is a colocator to the BLACK MAGIC MINING ASSOCIATION, the "operator" as defined in DMEA Order No.1. Each contribution is each partner's contribution to this partnership, the BLACK MAGIC MINING ASSOCIATION, and is made when each partner signsthis Certificate to signify his or her agreement.

9. LIMITED PARTNERS shall not substitute an assign as contributor in his or her place unless the substitution is approved by the GENERAL PARTNERS and the assign accepts and signs this agreement.

10. The Operator's contribution to the total cost of the EXPLORATION PROJECT will be made by the GENERAL PARTNERS in the manner to be proposed in the application to the DMEA for aid.

11. The GENERAL PARTNERS can admit additional LIMITED PARTNERS.

12. Any lodes or veins containing valuable minerals discovered within the BLACK MAGIC PLACER MINING CLAIMS shall be located and claimed in the name of the BLACK MAGIC MINING ASSOCIATION.

13 In the event that ore reserves are established and their monetary value can be estimated, each GENERAL and LIMITED PARTNER'S contribution shall be evaluated in terms of money in the same proportion as his or her contribution in terms of acres is to the total of all acreage contributed by all partners.

14. In the event of illness, injury, retirement, insanity, or death of a GENERAL PARTNER, the remaining GENERAL PARTNER shall continue in the completion of the EXPLORATION PROJECT CONTRACT.

Certificate of Limited Partnership (cont.)

This certificate shall be recorded in the Office of the County Recorder, in the city of Phoenix, Maricopa County, State of Arizona.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals the day and year first above written.

John L. Holt	Seal
Murry G. Espy	Seal
Viola W. Holt	Seal
Ruby B. Espy	Seal
C. L. Espy Jr.	Seal
Archie Babb	Seal
Lucille R. Woodward	Seal
Ernest C. Kneale	Seal

FILE COPY
SURNAME:
700

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

FEB 24 1953

Mr. Murry G. Espy, General Partner
Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

Re: Docket No. DMA-2300 (Monazite & Rare Earth Minerals)
Black Magic Placer Claim
Maricopa County, Arizona

Dear Mr. Espy:

This is with reference to the captioned application now being processed by this office for Government exploration aid.

To enable us to continue with the processing of your application we will require the following:

1. Furnish a copy of the partnership agreement.

2. Advise if the land to be explored is owned by captioned association (partnership). If this land is not owned by the Black Magic Mining Association we will require an original and six (6) copies of Form MF-203 "Owner's Consent to Lien" (enclosed) signed by each property owner of the land to be explored.

3. In your application you report various test pits were dug to depths of about six feet and samples were obtained from the material excavated. Please supply maps or sketches showing the location of those pits in relation to the mining claim lines; with either a section sketch of each pit or a narrative description which in either case (if available) describes the mineral content found in each pit in terms of pounds or percentage per ton or per cubic yard of material excavated. On the above maps or sketches please also show the proposed exploration work.

Upon receipt of the above information we will continue to process your application.

FLKnouse/jem 2/20/53
cc to: Adm. Reading File
Docket
Messrs: EJCarlson-3649
JJNorton-G-232 GSA
Ellis Knouse Ft Reg.IV (2)

Sincerely yours,

SIGNED

Ernest W. Ellis, Chief
Rare and Misc. Metals Division

Enclosures

2/24/53

IN REPLY REFER TO:

G-MD-CNM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

February 20, 1953

Memorandum

REVIEW OF APPLICATION DMEA-2880 (monazite and rare earth minerals)

To: Ernest William Ellis, Defense Minerals Exploration Administration
From: R. E. Van Alstine, U. S. Geological Survey
Applicant: Black Magic Mining Association, c/o Murry G. Espy, 714 North Seventh Avenue, Phoenix, Arizona.
Name of property: Black Magic Placer Mining Claims.
Location of property: Secs. 20,21,22,23,26,27,28,29, and 31, T. 4 N., R. 9 W., 40 miles by road northwest of Hassayampa Filling Station; Southwest corner of Big Horn Mountains, Arizona.
Estimated cost of project: $33,657.50.
Summary of applicant's proposal: Put down about 200 core holes (avg. depth 20 feet) and 100 hand-dug holes; collect, screen, and table samples, determining ratio of heavy minerals and radioactive count. Send heavy mineral concentrates to Government for determination of monazite and rare earth content. Samples to be obtained along north, south, and west boundaries of the property and around certain outcrops of Tertiary or later formations.
Sources of information on applicant's property: None.
Comments:

1) No production or occurrences of monazite and rare earth minerals have been reported from this property.
2) The application contains no information on what the applicant found in the preliminary exploration and sampling. The letters about the heavy concentrates, said under 4c to accompany the application, were not with the application reviewed.
3) Applicant's MF-103, item 3a, lists sections 15 and 30 among those to be explored. However, neither of these sections is shown under 3f or on his attached map as areas to be explored.

RECOMMENDATION:

If examination of applicant's letters mentioned above indicates the occurrence here of monazite and rare earth minerals in significant quantities, refer to field team for examination and for working out a plan for exploration, if warranted.

R. E. Van Alstine

R. E. Van Alstine

dmcw 2880

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

February 2, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 6 1953

Memorandum

To: Secretary to the Operating Committee
Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Monazite and Rare Earth Minerals) - Application of Black Magic Mining Assn., Black Magic Placer Claims, Maricopa County, Arizona

Enclosed are three copies of the subject application for aid in the amount of $33,657.50.

John F. Shaw
John F. Shaw, for
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosure

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

DEPARTMENT OF THE INTERIOR
Minerals Administration
RECEIVED
FEB 9 1953

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. dmea 2880
Metal or Mineral
Date Received 2-9-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: ~~BLACKXMXXXXX~~ BLACK MAGIC MINING ASSOCIATION ? a partnership organized in the State of Arizona, by Murry G. Espy, 714 Norhh Seventh Avenue, Phoenix, Arizona

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners. see accompanying papers

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Sections 15, 20, 21, 22, 23, 28, 29, 30, 31, and the N½ of sections 26 and 27, Township 4 North, Range 9 West G&SRBM

not listed under item 3 or shown on map.

(*b*) State any mine name by which the property is known. Black Magic Placer Mining Claims

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise unpatented placer mining claims

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it none

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. See accompanying papers

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. see accomapnying papers

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. " "

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. See accompanying lpapers

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. see accompanying papers

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

see accompanying papers

16—66551-1

5. *The exploration project.*—(*a*) [redacted]e the mineral or minerals for which you wi[redacted] explore monazite and rare earth minerals

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. see accompanying papers

(*c*) The work will start within 30 days and be completed within 9 months from the date of an exploration project contract. Period includes inactive time because of excessive hot weather

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. see accompanying papers

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[x] Money [x] Use of equipment owned by you [x] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated January 29, 1953

Black Magic Mining Association
(Applicant)

By Murray G. Espey

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

INSTRUCTIONS

1. (d) General Partners

Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

John L. Holt
Salome, Arizona

Limited Partners

Viola W. Holt
Salome, Arizona

Ruby B. Espy
714 N. Seventh Avenue
Phoenix, Arizona

Lucille Woodward
4529 N. Halifax Road
El Monte, California

C. L. Espy Jr.
307 E. Cowden St.
Midland, Texas

Archie Babb
Box 2
Colfax, Washington

Ernest C. Kneale
801 N. Sixth Avenue
Phoenix, Arizona

The partnership agreement was made by the above named partners to form the Black Magic Mining Association, a Limited Partnership, for the purpose of exploring and exploiting the Black Magic Placer Mining Claims which were located by the above named partners. One or both of the General Partners are empowered to file an application for aid in an exploration project and to enter into an Exploration Project Contract such as is set forth in DMEA Order No.1, if the application is approved.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

3. (f)

Black Magic Placer Mining Claim No.	Description	Docket No.	Page No.
9	NW¼ Sec. 31	956	254
10	NE¼ " 31	"	255
11	NW¼ " 20	"	256
12	NE¼ " 20	"	257
13	SW¼ " 20	"	258
14	SE¼ " 20	"	259
15	NW¼ " 29	"	260
16	NE¼ " 29	"	261
17	SW¼ " 29	"	262
18	SE¼ " 29	"	263
21	NW¼ " 21	"	264
22	NE¼ " 21	"	265
23	SW¼ " 21	"	266
24	SE¼ " 21	"	267
25	NW¼ " 28	"	268
26	NE¼ " 28	"	269
27	SW¼ " 28	"	270
28	SE¼ " 28	"	271
29	NW¼ " 28	"	272
30	NE¼ " 22	"	273
31	SW¼ " 22	"	274
32	SE¼ " 22	"	275
33	NW¼ " 27	"	276
34	NE¼ " 27	"	277
35	NW¼ " 23	"	278
36	NE¼ " 23	"	279
37	SW¼ " 23	"	280
38	SE¼ " 23	"	281
39	NW¼ " 26	"	282
40	NE¼ " 26	"	283
49	SW¼ " 31	"	284
50	SE¼ " 31	"	285

The above listed claims are recorded in the Recorder's Office of Maricopa County, Phoenix, Arizona .

4. (a) Only exploration operations have been and are now being conducted upon the Black Magic Placer Mining Claims. Test holes in the different drainage channels or "washes" have been dug to the depth of around six feet in order to determine the ratio of heavy minerals to light minerals, to determine the average size of cobble or boulder, and the depth to bedrock. The holes have been dug by hand, and by three of the partners. Samples were taken from each hole and from vertical channels made in each side of the hole. The total sample was weighed then the heavy minerals separated from light minerals by screening and gravity separation in a gold pan. Nearly all the heavy minerals will go through a 20 mesh screen. The heavy concentrates are weighed and ratio of heavy to light determined. The concentrates are dried before weighing. All test holes that were dug before the summer rains have been refilled with alluvial material . Six holes have been dug since that time and we are in the process of digging more at the present time. Unless heavy rains come these holes will be accessible for examination.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

4. (b) No production past or current has or is being made and no ore reserves have been established.

(c) Our property is located in the south western corner of the Big Horn Mountains. The general geological features of these mountains are given in the Arizona Bureau of Mines Bulletin No. 127, "Manganese Ore Deposits in Arizona", and in the United States Geological Survey Professional Paper 129-H, " Geology of the Lower Gila Region of Arizona", by Clyde P. Ross, published March 29,1922, as being pre-Cambrian granite, gneiss, and schist overlain by Tertiary lava flows. The claims in Sections 22 and 23 are for the most part overlain with outcrops of andesite and other extrusive rocks in the form of small hills as well as dikes and granitic outcrops here and there. To the east of these same claims a large granitic area apparently feeds the washes draining to the southwest with heavy concentrates that show higher Geiger count than from any other part of the area. However, there are outcrops of granite in Sections 15, 22, and 27 that give a small count with the counter. Sections 20,21,28,29, and 31 are mostly alluvial material and they have been examined only by shallow test holes to indicate the presence of heavy concentrates that give a small Geiger count.

In the eastern half of the area there is evidence that the drainage channels have meandered over periods of time and the older stream beds in places are higher than the present beds. In the western half the overburden is a finer alluvium cut by small drainage channels. The several large washes originating in the eastern end of the property flow down to the south west corner of the property to form one large wash.

In the NE¼ of Section 30, there is a cattle range well. The man who drilled this well gave me the information that he drilled through alluvium for about 90 feet before going into bed rock. About a mile east of this well there is a small hill formed of extrusive rock and to the south east about the same distance is the western limit of a large body of lava flow that rests the granite in the eastern area of Range 9 of both Townships 3 and 4 North. The one large wash mentioned in the preceding paragraphturns southward around the lava flow rock and spreads out into smaller washes in T3N and into another separate group of claims.

Accompanying this application are several letters that give some information about the heavy concentrates obtained from samples sent away for examination. These letters carry a notation of my desire to have them returned to me.

(d) The project is about 40 miles from the Hassayampa Filling Station which is 9 miles west of Buckeye on US Hwy.80. Turning off to the NW at Hassayampa Filling Station on a county road between the Station and Salome, it is about 33 miles on this county road to a trail going north. About 7 miles north on this trail is the property. About a mile NW of Hassayampa there is a siding called Dixie on the Southern Pacific R.R. About 20 miles north over desert and mountain trail is Aguila on the Santa Fe R.R. running between Wickenburg and Parker, Arizona. Phoenix is 32 miles east of Buckeye, and both are supply centers. The nearest residence point is my (Murry G. Espy) homestead.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 E. Seventh Avenue
Phoenix, Arizona

4. (d) Manpower is available. Materials, supplies, and equipment are available at Phoenix and Buckeye.

Water for the Exploration Project is available at the Murry G. Espy homestead and for small quantities at the cattle range well within the property. If electric power is necessary generating equipment will be necessary. The nearest Public Service power is about 20 miles distant.

5. (b) The proposed work is for the delineation and sampling of the property. We propose to put down approximately 200 holes with Acker Drill Co., core equipment and 100 hand dug shallow holes. Drilling for the core samples is to be done by contract and the hand dug holes by two of the partners and two men to be hired for the project. Samples obtained are to screened and tabled on a small table to determine the ratio of the weight of heavy concentrates to the total weight of the sample and the radio active count for each sample recorded. The recorded data for each sample and the heavy concentrate portion of each sample sent to a designated Agency of the Government, for determination of monazite and rare earth content.

The samples are to be obtained along the north, south, and west boundaries of the property as well as around certain outcrops of Tertiary or later rock formations.

(d) John L. Holt and the writer, Murry G. Espy at various times during the past twenty years have been engaged in prospecting and mineral exploration in Arizona and California in both placer and "hard rock" operations. The writer is a Graduate of the University of Illinois and of the Graduate School of Business Administration of Harvard University. He has had cost and general accounting experience in textile finishing, the Western Electric Co., oil production, and aircraft production. Mr. Holt and I shall assume responsibility for supervision of the operations as well as do some of the work in obtaining, handling, and making observations to secure pertinent data of the samples. I shall assume the responsibility of all records and accounting. The foregoing experience combined with special study during the past five years does give to us the qualification to confront and solve the problems involved in this proposed exploration project. We both know much of the geology of this district wherein we have both lived and working over a period of years.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
BY Murry B. Espy
714 N. Seventh Avenue
Phoenix Arizona

6. (a) Acker equipment core sampling
200 samples
20 feet average depth
4000 feet @ $4.00 per foot — $16,000.00

(b) Supervision and labor
1- Supervisor, 26 weeks @ $175.00 per week
wages and subsistence — 4,550.00
3- Field and sample men, 26 weeks @ $125.00 per week
wages and subsistence — 9,750.00

(c) Gasoline, 1500 gal. @ 21¢ per gal. — 315.00
Oil 50 gal. @ 80¢ per gal. — 40.00
Water 50,000 gal. @ .3¢ per gal. — 150.00

(f) 1- Work shed 16' by 30' — 300.00
1- 1500 gal water tank — 227.00
Water line (pipe and fittings) — 15.00

(d) 1- Jeep truck rental $7.00 per day- 130 days — 910.00
1- No. 13 Wilfley table with power for 26 weeks — 150.00

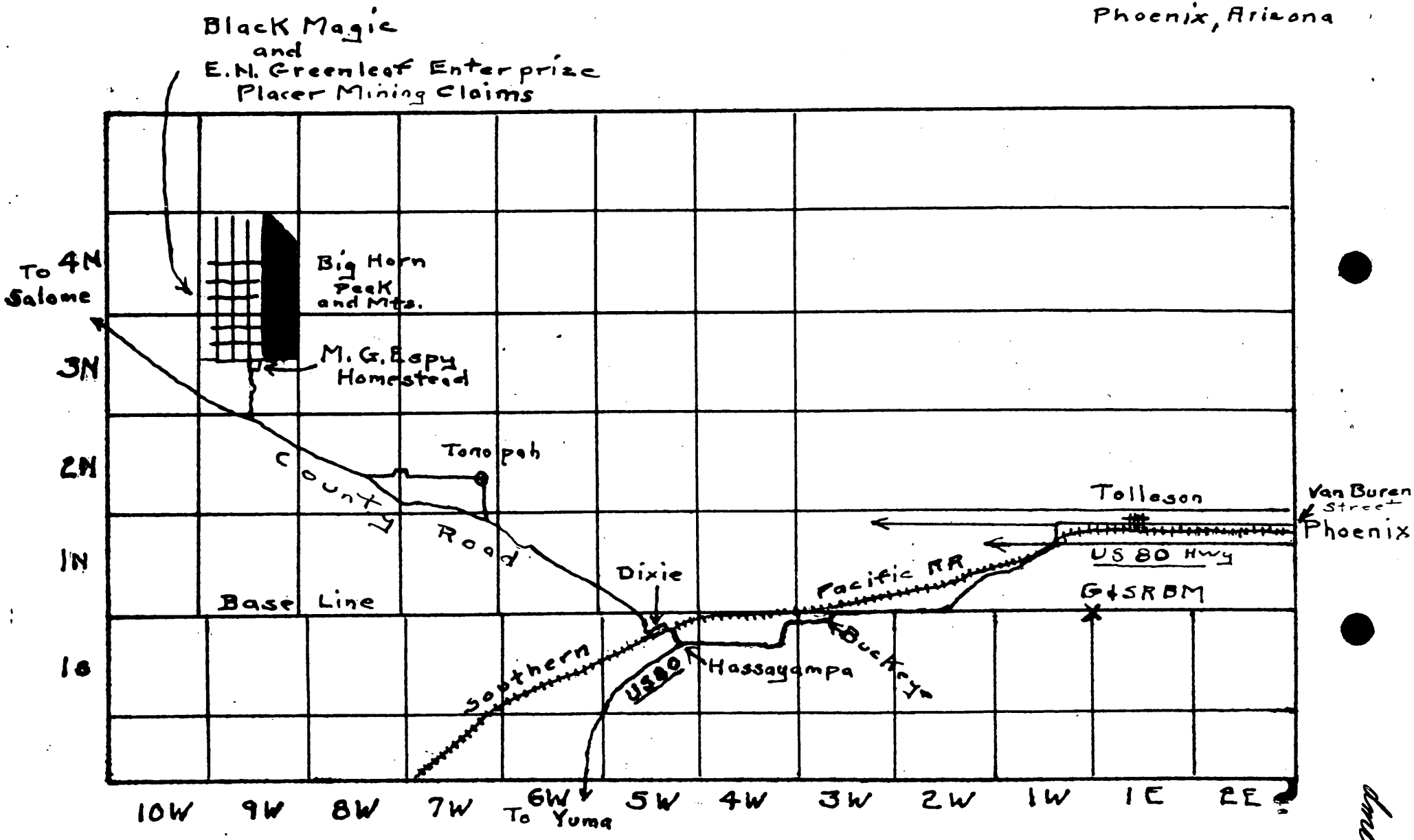
(g) Office supplies — 35.00
Workingmen's compensation — 464.75
Unemployment insur. contrib. — 429.00
Social Security — 214.50
Liability Insurance — 107.25

(h) Unknown expense involved in disposition of heavy concentrate portion of each sample

Total of known estimated costs — $33,657.50

7. (b) We are prepared to furnish our share of costs in money, the rental costs of Jeep truck and Wilfley table, cost of water, work shed, and water tank.

Murry G. Espy
714 N. 7th Ave.
Phoenix, Arizona

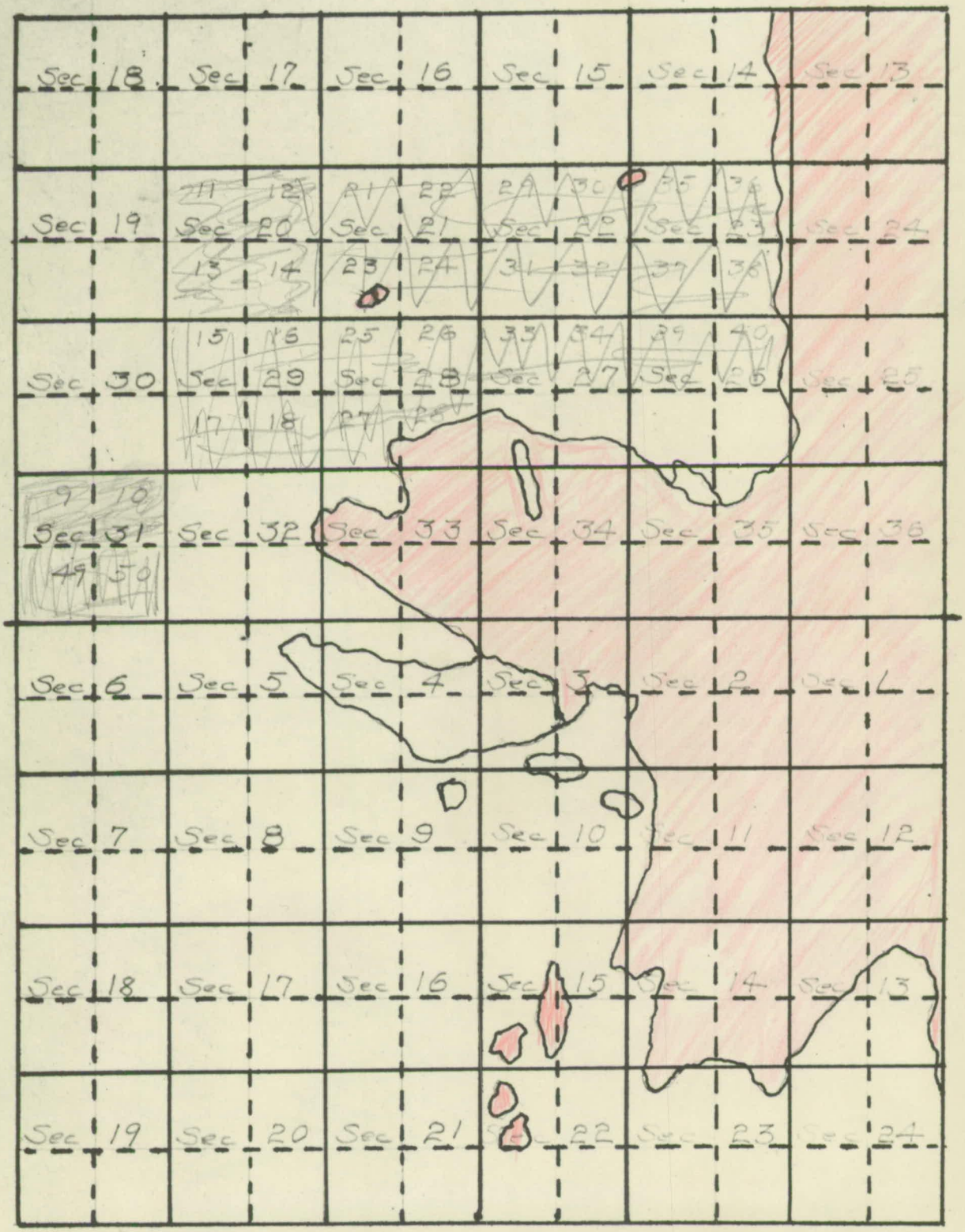


Original 3880

Murry C. Espy
714 N. 7th Ave.
Phoenix, Arizona

dmea 2880

R 9 W



Tertiary outcrop

2/16/53 gla

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

February 13, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 16 1953

Memorandum

To: Ernest William Ellis, DMEA Member
Uranium Commodity Committee, Room 4640

From: E. J. Carlson, Commodity-Industry Analyst, Rare and Precious Metals Branch

Subject: Black Magic Mining Association, Maricopa County, Arizona, Docket No. DMEA 2880

The above named docket has been reviewed. The following comments are offered for your consideration.

1. The docket contains no information of the indicated or inferred monazite and rare earth content. The results of the sampling by the applicant are not submitted. No mineral analyses or chemical assays are included.

2. The applicant proposes to explore the alluvium on the property with "Acker core sampling equipment". This type of equipment I am not familiar with. But, if the material to be explored is alluvials then I would suggest a churn drill program rather than core drilling.

3. If the cattle range well was drilled through alluvium for 90 feet, why should his proposed drill holes average only 20 feet?

4. The itemized costs prepared by the applicant appear reasonable. However, a cost should be submitted for the analysis of the heavy concentrates.

It is recommended that the applicant submit an estimate of tonnage or yardage, and the results of his sampling with the respective analyses. If this appears favorable, a field examination should be made. The field team should consider, besides the mineral content and size of the property, the availability of water in sufficient quantity to make feasible a mining exploitation.

E. J. Carlson

E. J. Carlson

dmea 2880

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

February 2, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 16 1953

Mr. Murry G. Espy
714 North 7th Avenue
Phoenix, Arizona

Dear Mr. Espy:

This will acknowledge receipt of your application for exploration aid on the Black Magic Placer Mining Claims.

This application has been forwarded to the Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C. for their review.

Very truly yours,

John F. Shaw

John F. Shaw, for
W. H. King
Executive Officer
DMEA Field Team, Region IV

cc: Sec.Oper.Comm.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved
Budget Bureau No. 42-R1035.2.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 16 1953

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. dmea 2880
Metal or Mineral
Date Received 2-9-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: BLACK MAGIC MINING ASSOCIATION, a partnership organized in the State of Arizona, by Murry G. Espy 714 North Seventh Ave., Phoenix, Arizona

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners. see accompanying papers

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Sections 15,20,21,22,23,28,29,30,31, and the N½ of Sections 26 and 27, Township 3 North, Range 9 West, G&SRBM

(*b*) State any mine name by which the property is known. Black Magic Placer Mining Claims

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise unpatented placer mining claims

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it none

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. See accompanying papers

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. see accompanying papers

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. see accomapnying papers

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. see accompanying papers

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

see accompanying papers

5. *The exploration project.*—(*a*) [redacted]te the mineral or minerals for which you wi[redacted] explore
Monazite and rare earth minerals

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. see accompanying papers

(*c*) The work will start within 30 days and be completed within 9 months from the date of an exploration project contract. Period includes inactive time because of hot weather

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. see accompanying papers

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[x] Money [x] Use of equipment owned by you [x] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated January 29, 1953

Black Magic Mining Association
(Applicant)

By Murray J. Espey

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

INSTRUCTIONS

1. (d) General Partners

Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

John L. Holt
Salome, Arizona

Limited Partners

Viola W. Holt
Salome, Arizona

Ruby B. Espy
714 N. Seventh Avenue
Phoenix, Arizona

Lucille Woodward
4529 N. Halifax Road
El Monte, California

C. L. Espy Jr.
307 E. Cowden St.
Midland, Texas

Archie Babb
Box 2
Colfax, Washington

Ernest C. Kneale
801 N. Sixth Avenue
Phoenix, Arizona

The partnership agreement was made by the above named partners to form the Black Magic Mining Association, a Limited Partnership, for the purpose of exploring and exploiting the Black Magic Placer Mining Claims which were located by the above named partners. One or both of the General Partners are empowered to file an application for aid in an exploration project and to enter into an Exploration Project Contract such as is set forth in DMEA Order No.1, if the application is approved.

Appli[illegible]ion for Aid in an Exploration [illegible]ject
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

3. (f)

Black Magic Placer Mining Claim No.	Description	Docket No.	Page No.
9	NW¼ Sec. 31	956	254
10	NE¼ " 31	"	255
11	NW¼ " 20	"	256
12	NE¼ " 20	"	257
13	SW¼ " 20	"	258
14	SE¼ " 20	"	259
15	NW¼ " 29	"	260
16	NE¼ " 29	"	261
17	SW¼ " 29	"	262
18	SE¼ " 29	"	263
21	NW¼ " 21	"	264
22	NE¼ " 21	"	265
23	SW¼ " 21	"	266
24	SE¼ " 21	"	267
25	NW¼ " 28	"	268
26	NE¼ " 28	"	269
27	SW¼ " 28	"	270
28	SE¼ " 28	"	271
29	NW¼ " 28	"	272
30	NE¼ " 22	"	273
31	SW¼ " 22	"	274
32	SE¼ " 22	"	275
33	NW¼ " 27	"	276
34	NE¼ " 27	"	277
35	NW¼ " 23	"	278
36	NE¼ " 23	"	279
37	SW¼ " 23	"	280
38	SE¼ " 23	"	281
39	NW¼ " 26	"	282
40	NE¼ " 26	"	283
49	SW¼ " 31	"	284
50	SE¼ " 31	"	285

The above listed claims are recorded in the Recorder's Office of Maricopa County, Phoenix, Arizona .

4. (a) Only exploration operations have been and are now being conducted upon the Black Magic Placer Mining Claims. Test holes in the different drainage channels or "washes" have been dug to the depth of around six feet in order to determine the ratio of heavy minerals to light minerals, to determine the average size of cobble or boulder, and the depth to bedrock. The holes have been dug by hand, and by three of the partners. Samples were taken from each hole and from vertical channels made in each side of the hole. The total sample was weighed then the heavy minerals separated from light minerals by screening and gravity separation in a gold pan. Nearly all the heavy minerals will go through a 20 mesh screen. The heavy concentrates are weighed and ratio of heavy to light determined. The concentrates are dried before weighing. All test holes that were dug before the summer rains have been refilled with alluvial material . Six holes have been dug since that time and we are in the process of digging more at the present time. Unless heavy rains come these holes will be accessible for examination.

Appl[illegible]ation for Aid in an Exploration [illegible]roject
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

4. (b) No production past or current has or is being made and no ore reserves have been established.

(c) Our property is located in the south western corner of the Big Horn Mountains. The general geological features of these mountains are given in the Arizona Bureau of Mines Bulletin No. 127, "Manganese Ore Deposits in Arizona", and in the United States Geological Survey Professional Paper 129-H, " Geology of the Lower Gila Region of Arizona", by Clyde P. Ross, published March 29,1922, as being pre-Cambrian granite, gneiss, and schist overlain by Tertiary lava flows. The claims in Sections 22 and 23 are for the most part overlain with outcrops of andesite and other extrusive rocks in the form of small hills as well as dikes and granitic outcrops here and there. To the east of these same claims a large granitic area apparently feeds the washes draining to the southwest with heavy concentrates that show higher Geiger count than from any other part of the area. However, there are outcrops of granite in Sections 15, 22, and 27 that give a small count with the counter. Sections 20,21,28,29, and 31 are mostly alluvial material and they have been examined only by shallow test holes to indicate the presence of heavy concentrates that give a small Geiger count.

In the eastern half of the area there is evidence that the drainage channels have meandered over periods of time and the older stream beds in places are higher than the present beds. In the western half the overburden is a finer alluvium cut by small drainage channels. The several large washes originating in the eastern end of the property flow down to the south west corner of the property to form one large wash.

In the NE¼ of Section 30, there is a cattle range well. The man who drilled this well gave me the information that he drilled through alluvium for about 90 feet before going into bed rock. About a mile east of this well there is a small hill formed of extrusive rock and to the south east about the same distance is the western limit of a large body of lava flow that rests the granite in the eastern area of Range 9 of both Townships 3 and 4 North. The one large wash mentioned in the preceding paragraphturns southward around the lava flow rock and spreads out into smaller washes in T3N and into another separate group of claims.

Accompanying this application are several letters that give some information about the heavy concentrates obtained from samples sent away for examination. These letters carry a notation of my desire to have them returned to me.

(d) The project is about 40 miles from the Hassayampa Filling Station which is 9 miles west of Buckeye on US Hwy.80. Turning off to the NW at Hassayampa Filling Station on a county road between the Station and Salome, it is about 33 miles on this county road to a trail going north. About 7 miles north on this trail is the property. About a mile NW of Hassayampa there is a siding called Dixie on the Southern Pacific R.R. About 20 miles north over desert and mountain trail is Aguila on the Santa Fe R.R. running between Wickenburg and Parker, Arizona. Phoenix is 32 miles east of Buckeye, and both are supply centers. The nearest residence point is my (Murry G. Espy) homestead.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

4. (d) Manpower is available. Materials, supplies, and equipment are available at Phoenix and Buckeye.

Water for the Exploration Project is available at the Murry G. Espy homestead and for small quantities at the cattle range well within the property. If electric power is necessary generating equipment will be necessary. The nearest Public Service power is about 20 miles distant.

5. (b) The proposed work is for the delineation and sampling of the property. We propose to put down approximately 200 holes with Acker Drill Co., core equipment and 100 hand dug shallow holes. Drilling for the core samples is to be done by contract and the hand dug holes by two of the partners and two men to be hired for the project. Samples obtained are to screened and tabled on a small table to determine the ratio of the weight of heavy concentrates to the total weight of the sample and the radio active count for each sample recorded. The recorded data for each sample and the heavy concentrate portion of each sample sent to a designated Agency of the Government, for determination of monazite and rare earth content.

The samples are to be obtained along the north, south, and west boundaries of the property as well as around certain outcrops of Tertiary or later rock formations.

(d) John L. Holt and the writer, Murry G. Espy at various times during the past twenty years have been engaged in prospecting and mineral exploration in Arizona and California in both placer and "hard rock" operations. The writer is a Graduate of the University of Illinois and of the Graduate School of Business Administration of Harvard University. He has had cost and general accounting experience in textile finishing, the Western Electric Co., oil production, and aircraft production. Mr. Holt and I shall assume responsibility for supervision of the operations as well as do some of the work in obtaining, handling, and making observations to secure pertinent data of the samples. I shall assume the responsibility of all records and accounting. The foregoing experience combined with special study during the past five years does give to us the qualification to confront and solve the problems involved in this proposed exploration project. We both know much of the geology of this district wherein we have both lived and working over a period of years.

Appl[illegible]tion for Aid in an Exploration [illegible]bject
BLACK MAGIC MINING ASSOCIATION
BY Murry B. Espy
714 N. Seventh Avenue
Phoenix Arizona

6. (a) Acker equipment core sampling
200 samples
20 feet average depth
4000 feet @ $4.00 per foot $16,000.00

(b) Supervision and labor
1- Supervisor, 26 weeks @ $175.00 per week
wages and subsistence 4,550.00
3- Field and sample men, 26 weeks @ $125.00 per week
wages and subsistence 9,750.00

(c) Gasoline, 1500 gal. @ 21¢ per gal. 315.00
Oil 50 gal. @ 80¢ per gal. 40.00
Water 50,000 gal. @ .3¢ per gal. 150.00

(f) 1- Work shed 16' by 30' 300.00
1- 1500 gal water tank 227.00
Water line (pipe and fittings) 15.00

(d) 1- Jeep truck rental $7.00 per day- 130 days 910.00
1- No. 13 Wilfley table with power for 26 weeks 150.00

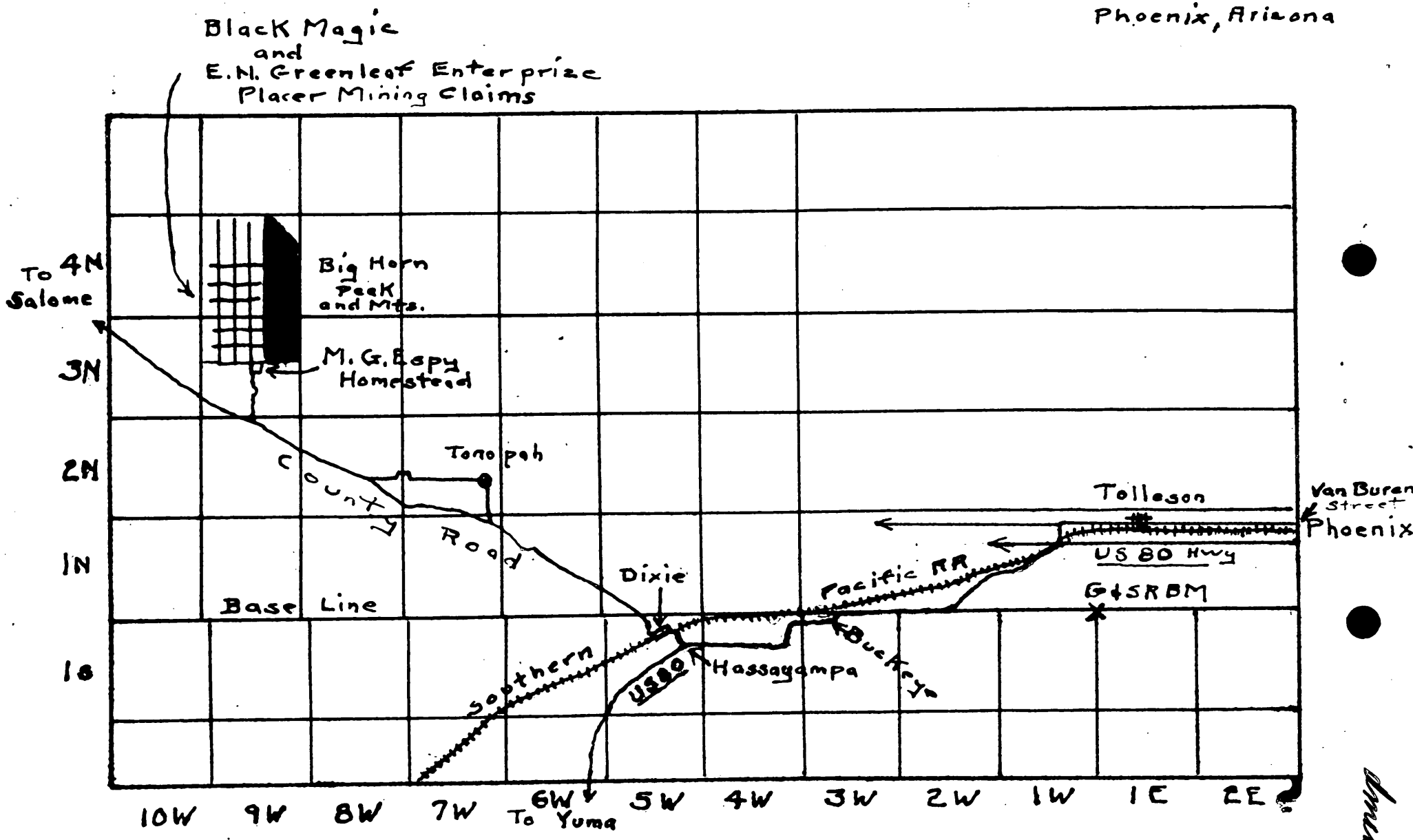
(g) Office supplies 35.00
Workingmen's compensation 464.75
Unemployment insur. contrib. 429.00
Social Security 214.50
Liability Insurance 107.25

(h) Unknown expense involved in disposition of heavy concentrate portion of each sample

Total of known estimated costs $33,657.50

7. (b) We are prepared to furnish our share of costs in money, the rental costs of Jeep truck and Wilfley table, cost of water, work shed, and water tank.

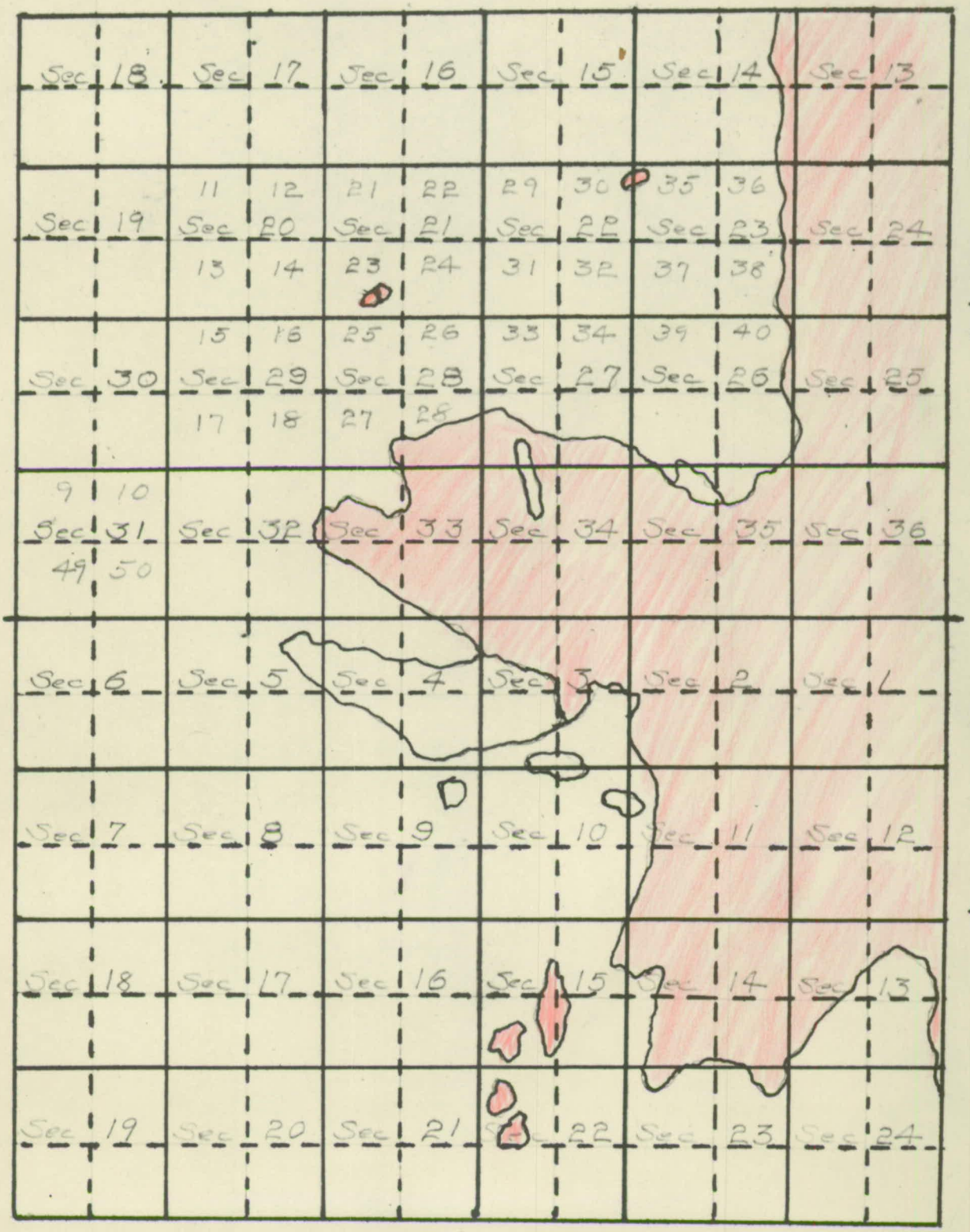
Murry G. Espy
714 N. 7th Ave.
Phoenix, Arizona



Plan 1880

Murry G. Espy
714 N. 7th Ave.
Phoenix, Arizona
dmea 2880

R9W



Tertiary
outcrop

February 11, 1953

Mr. Murry G. Espy, General Partner
Black Magic Mining Association
714 N. Seventh Avenue
Phoenix, Arizona

Subject: DMEA-2880
Re: Exploration Assistance
Black Magic Placer Claims

My dear Mr. Espy:

The receipt of your application dated January 29, 1953 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-2880 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-2880 in any future correspondence relating to your application.

Sincerely yours,

R. E. ADAMS

Robert E. Adams
Chief, Operations Control
and Statistics Division

25451

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

February 11, 1953

Memorandum

To: Executive Officer, DMEA Field Team, Region IV

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region IV.

DMEA-2880 Black Magic Mining Association

R. E. ADAMS

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

33980

dmea 2880

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

February 2, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 9 1953

Memorandum

To: Secretary to the Operating Committee
Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Monazite and Rare Earth Minerals) - Application of Black Magic Mining Assn., Black Magic Placer Claims, Maricopa County, Arizona

Enclosed are three copies of the subject application for aid in the amount of $33,657.50.

John F. Shaw, for
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosure

dmea 2880

714 N orth 7th Avenue
Phoenix, Arizona

January 29, 1953

Mr W. H . K ing,
Executive Officer, DMEA
224 Customhouse Building
Denver 2, Colorado.

Dear Mr. K ing;

Enclosed herewith is APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED.

In my mind there is still some uncertainty as to the disposition and examination of the heavy concentrates recovered in this placer ground. However, I am sending the application in quadruplet to you at this time.

Yours very truly,

Murryn B. Kepy

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 9 1953

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. dmea 21880
Metal or Mineral
Date Received 2-9-53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: BLACK MAGIC MINING ASSOCIATION, a Partnership organized in the State of Arizona, by MURRY G. ESPY, 714 North Seventh Avenue, Phoenix, Arizona

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners. See accompanying papers.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Sections 15, 20,21,22,23,28,29,30,31, and the N½ of Sections 26 and 27, Township 4 North, Range 9West, G&SRBM

(*b*) State any mine name by which the property is known. Black Magic Placer Claims

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Unpatented placer mining claims

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it none

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. See accompanying papers

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes. see accompying papers

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades. see accompanying paper

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. see accompanying papers

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. see accompanying papers

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. see accompanying papers

16—66551-1

5. *The exploration project.*—(*a*) [illegible]e the mineral or minerals for which you wis[illegible] explore monazite and rare earth minerals

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. see accompanying papers

(*c*) The work will start within 30 days and be completed within 9 months from the date of an exploration project contract. Period includes inactive time because of excessive hot weather

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. see accompanying papers

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [X] Use of equipment owned by you [X] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated January 29, 1953

Black Magic Mining Association
(Applicant)

By Murray G. Capps

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

INSTRUCTIONS

1. (d) General Partners

Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

John L. Holt
Salome, Arizona

Limited Partners

Viola W. Holt
Salome, Arizona

Ruby B. Espy
714 N. Seventh Avenue
Phoenix, Arizona

Lucille Woodward
4529 N. Halifax Road
El Monte, California

C. L. Espy Jr.
307 E. Cowden St.
Midland, Texas

Archie Babb
Box 2
Colfax, Washington

Ernest C, Kneale
801 N. Sixth Avenue
Phoenix, Arizona

The partnership agreement was made by the abbve named partners to form the Black Magic Mining Association, a Limited Partnership, for the purpose of exploring and exploiting the Black Magic Placer Mining Claims which were located by the above named partners. One or both of the General Partners are empowered to file an application for aid in an exploration project and to enter into an Exploration Project Contract such as is set forth in DMEA Order No.1, if the application is approved.

Appl[illegible]tion for Aid in an Exploration [illegible]oject
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

3. (f)

Black Magic Placer Mining Claim No.	Description	Docket No.	Page No.
9	NW¼ Sec. 31	956	254
10	NE¼ " 31	"	255
11	NW¼ " 20	"	256
12	NE¼ " 20	"	257
13	SW¼ " 20	"	258
14	SE¼ " 20	"	259
15	NW¼ " 29	"	260
16	NE¼ " 29	"	261
17	SW¼ " 29	"	262
18	SE¼ " 29	"	263
21	NW¼ " 21	"	264
22	NE¼ " 21	"	265
23	SW¼ " 21	"	266
24	SE¼ " 21	"	267
25	NW¼ " 28	"	268
26	NE¼ " 28	"	269
27	SW¼ " 28	"	270
28	SE¼ " 28	"	271
29	NW¼ " 22	"	272
30	NE¼ " 22	"	273
31	SW¼ " 22	"	274
32	SE¼ " 22	"	275
33	NW¼ " 27	"	276
34	NE¼ " 27	"	277
35	NW¼ " 23	"	278
36	NE¼ " 23	"	279
37	SW¼ " 23	"	280
38	SE¼ " 23	"	281
39	NW¼ " 26	"	282
40	NE¼ " 26	"	283
49	SW¼ " 31	"	284
50	SE¼ " 31	"	285

The above listed claims are recorded in the Recorder's Office of Maricopa County, Phoenix, Arizona .

4. (a) Only exploration operations have been and are now being conducted upon the Black Magic Placer Mining Claims. Test holes in the different drainage channels or "washes" have been dug to the depth of around six feet in order to determine the ratio of heavy minerals to light minerals, to determine the average size of cobble or boulder, and the depth to bedrock. The holes have been dug by hand, and by three of the partners. Samples were taken from each hole and from vertical channels made in each side of the hole. The total sample was weighed then the heavy minerals separated from light minerals by screening and gravity separation in a gold pan. Nearly all the heavy minerals will go through a 20 mesh screen. The heavy concentrates are weighed and ratio of heavy to light determined. The concentrates are dried before weighing. All test holes that were dug before the summer rains have been refilled with alluvial material . Six holes have been dug since that time and we are in the process of digging more at the present time. Unless heavy rains come these holes will be accessible for examination.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

4. (b) No production past or current has or is being made and no ore reserves have been established.

(c) Our property is located in the south western corner of the Big Horn Mountains. The general geological features of these mountains are given in the Arizona Bureau of Mines Bulletin No. 127, "Manganese Ore Deposits in Arizona", and in the United States Geological Survey Professional Paper 129-H, " Geology of the Lower Gila Region of Arizona", by Clyde P. Ross, published March 29,1922, as being pre-Cambrian granite, gneiss, and schist overlain by Tertiary lava flows. The claims in Sections 22 and 23 are for the most part overlain with outcrops of andesite and other extrusive rocks in the form of small hills as well as dikes and granitic outcrops here and there. To the east of these same claims a large granitic area apparently feeds the washes draining to the southwest with heavy concentrates that show higher Geiger count than from any other part of the area. However, there are outcrops of granite in Sections 15, 22, and 27 that give a small count with the counter. Sections 20,21,28,29, and 31 are mostly alluvial material and they have been examined only by shallow test holes to indicate the presence of heavy concentrates that give a small Geiger count.

In the eastern half of the area there is evidence that the drainage channels have meandered over periods of time and the older stream beds in places are higher than the present beds. In the western half the overburden is a finer alluvium cut by small drainage channels. The several large washes originating in the eastern end of the property flow down to the south west corner of the property to form one large wash.

In the NE¼ of Section 30, there is a cattle range well. The man who drilled this well gave me the information that he drilled through alluvium for about 90 feet before going into bed rock. About a mile east of this well there is a small hill formed of extrusive rock and to the south east about the same distance is the western limit of a large body of lava flow that rests the granite in the eastern area of Range 9 of both Townships 3 and 4 North. The one large wash mentioned in the preceding paragraphturns southward around the lava flow rock and spreads out into smaller washes in T3N and into another separate group of claims.

Accompanying this application are several letters that give some information about the heavy concentrates obtained from samples sent away for examination. These letters carry a notation of my desire to have them returned to me.

(d) The project is about 40 miles from the Hassayampa Filling Station which is 9 miles west of Buckeye on US Hwy.80. Turning off to the NW at Hassayampa Filling Station on a county road between the Station and Salome, it is about 33 miles on this county road to a trail going north. About 7 miles north on this trail is the property. About a mile NW of Hassayampa there is a siding called Dixie on the Southern Pacific R.R. About 20 miles north over desert and mountain trail is Aguila on the Santa Fe R.R. running between Wickenberg and Parker, Arizona. Phoenix is 32 miles east of Buckeye, and both are supply centers. The nearest residence point is my (Murry G. Espy) homestead.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
by Murry G. Espy
714 N. Seventh Avenue
Phoenix, Arizona

4. (d) Manpower is available. Materials, supplies, and equipment are available at Phoenix and Buckeye.

Water for the Exploration Project is available at the Murry G. Espy homestead and for small quantities at the cattle range well within the property. If electric power is necessary generating equipment will be necessary. The nearest Public Service power is about 20 miles distant.

5. (b) The proposed work is for the delineation and sampling of the property. We propose to put down approximately 200 holes with Acker Drill Co., core equipment and 100 hand dug shallow holes. Drilling for the care samples is to be done by contract and the hand dug holes by two of the partners and two men to be hired for the project. Samples obtained are to screened and tabled on a small table to determine the ratio of the weight of heavy concentrates to the total weight of the sample and the radio active count for each sample recorded. The recorded data for each sample and the heavy concentrate portion of each sample sent to a designated Agency of the Government, for determination of monazite and rare earth content.

The samples are to be obtained along the north, south, and west boundaries of the property as well as around certain outcrops of Tertiary or later rock formations.

(d) John L. Holt and the writer, Murry G. Espy at various times during the past twenty years have been engaged in prospecting and mineral exploration in Arizona and California in both placer and "hard rock" operations. The writer is a Graduate of the University of Illinois and of the Graduate School of Business Administration of Harvard University. He has had cost and general accounting experience in textile finishing, the Western Electric Co., oil production, and aircraft production. Mr. Holt and I shall assume responsibility for supervision of the operations as well as do some of the work in obtaining, handling, and making observations to secure pertinent data of the samples. I shall assume the responsibility of all records and accounting. The foregoing experience combined with special study during the past five years does give to us the qualification to confront and solve the problems involved in this proposed exploration project. We both know much of the geology of this district wherein we have both lived and working over a period of years.

Application for Aid in an Exploration Project
BLACK MAGIC MINING ASSOCIATION
BY Murry B. Espy
714 N. Seventh Avenue
Phoenix Arizona

6. (a) Acker equipment core sampling
200 samples
20 feet average depth
4000 feet @ $4.00 per foot — $16,000.00

Supervision and labor

(b) 1- Supervisor, 26 weeks @ $175.00 per week
wages and subsistence — 4,550.00
3- Field and sample men, 26 weeks @ $125.00 per week
wages and subsistence — 9,750.00

(c) Gasoline, 1500 gal. @ 21¢ per gal. — 315.00
Oil 50 gal. @ 80¢ per gal. — 40.00
Water 50,000 gal. @ .3¢ per gal. — 150.00

(e) 1- Work shed 16' by 30' — 300.00
1- 1500 gal water tank — 227.00
Water line (pipe and fittings) — 15.00

(d) 1- Jeep truck rental $7.00 per day- 130 days — 910.00
1- No. 13 Wilfley table with power for 26 weeks — 150.00

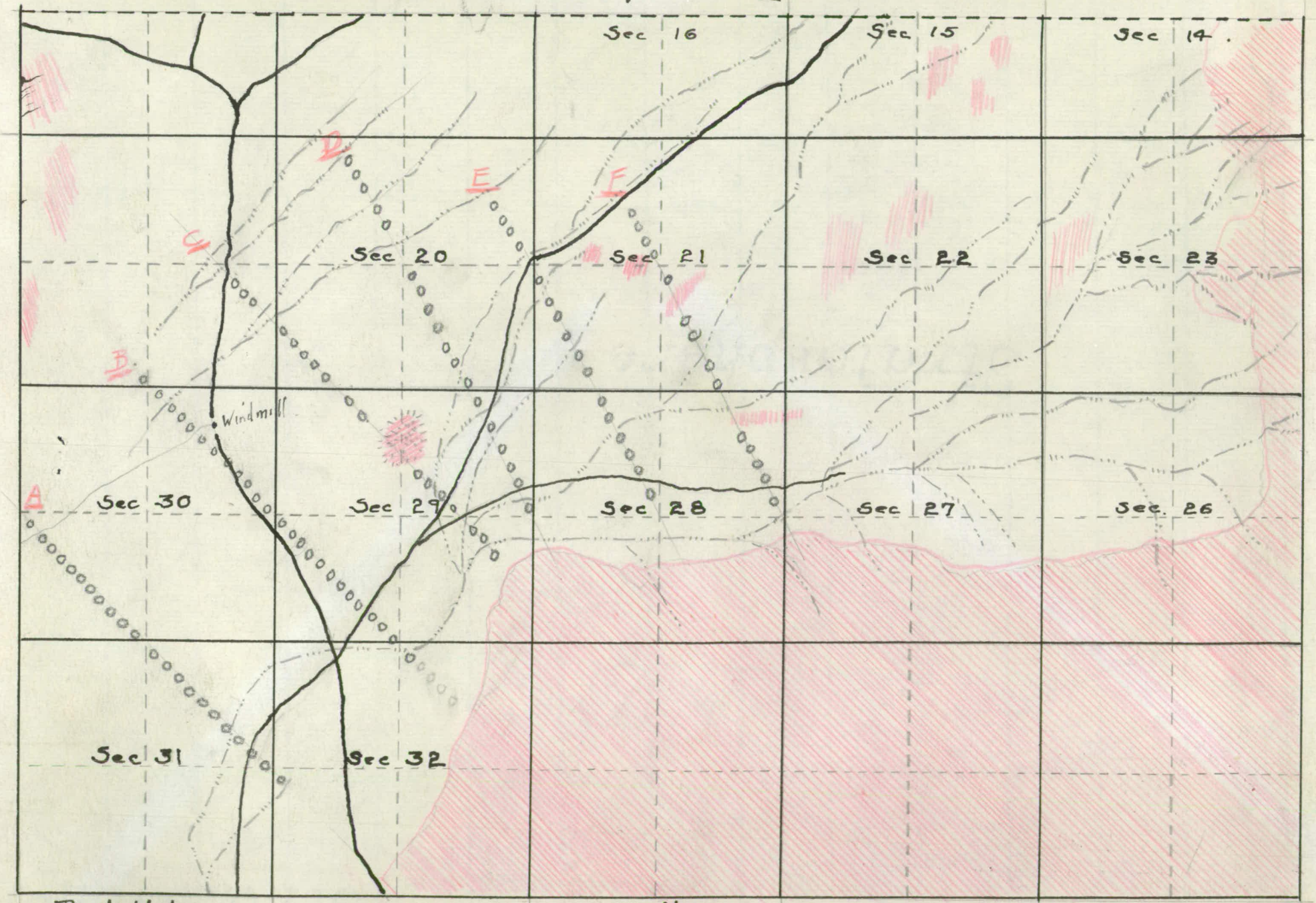
(G) Office supplies — 35.00
Workingmen's compensation — 464.75
Unemployment insur. contrib. — 429.00
Social Security — 214.50
Liability Insurance — 107.25

(h) Unknown expense involved in disposition of heavy concentrate portion of each sample

Total of known estimated costs — $33,657.50

7. (b) We are prepared to furnish our share of costs in money, the rental costs of Jeep truck and Wilfley table, cost of water, work shed, and water tank.

Black Magic Placer Claims
T 4 North Range 9 West
Maricopa County, Arizona



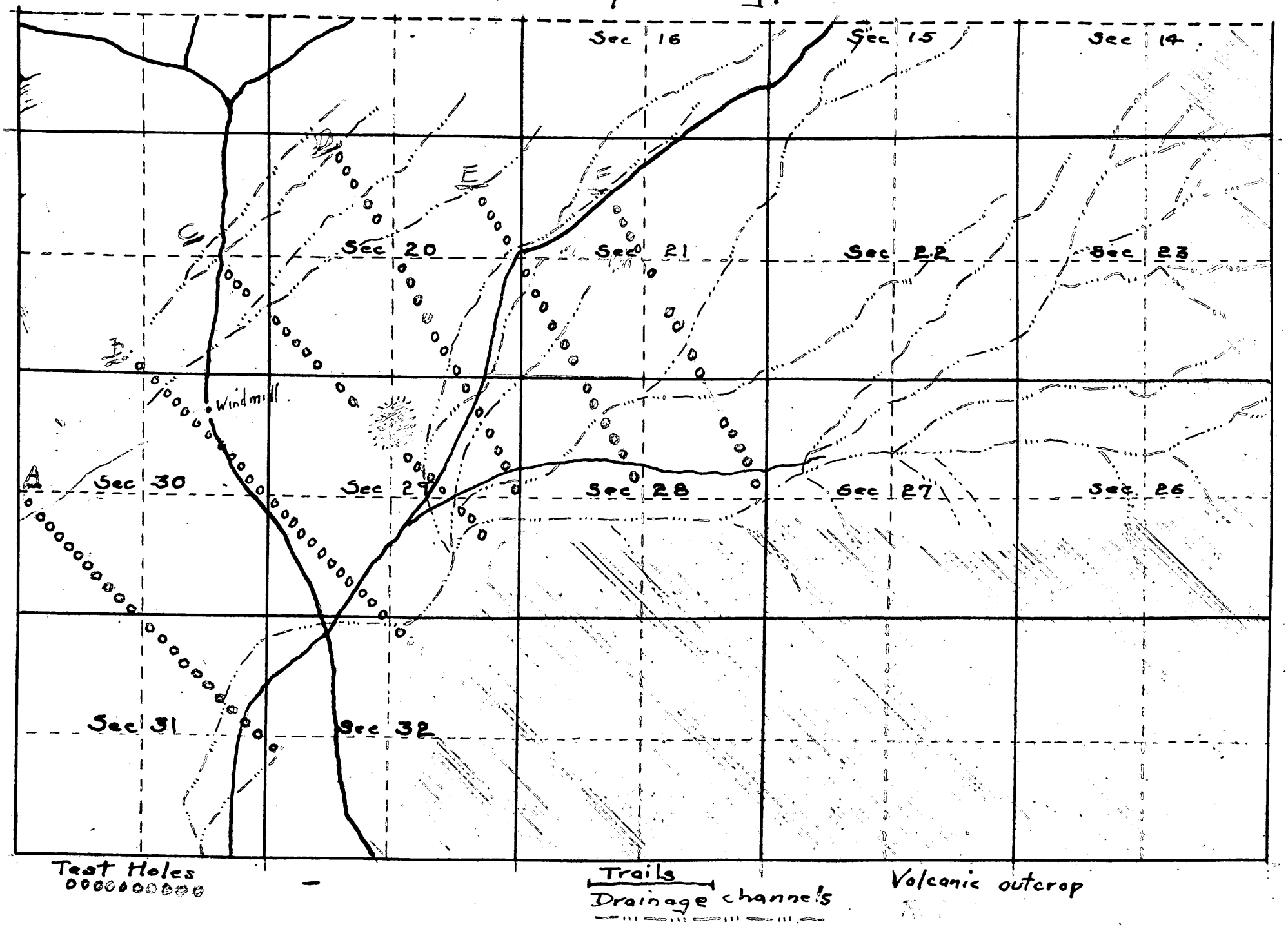
Test Holes

Trails

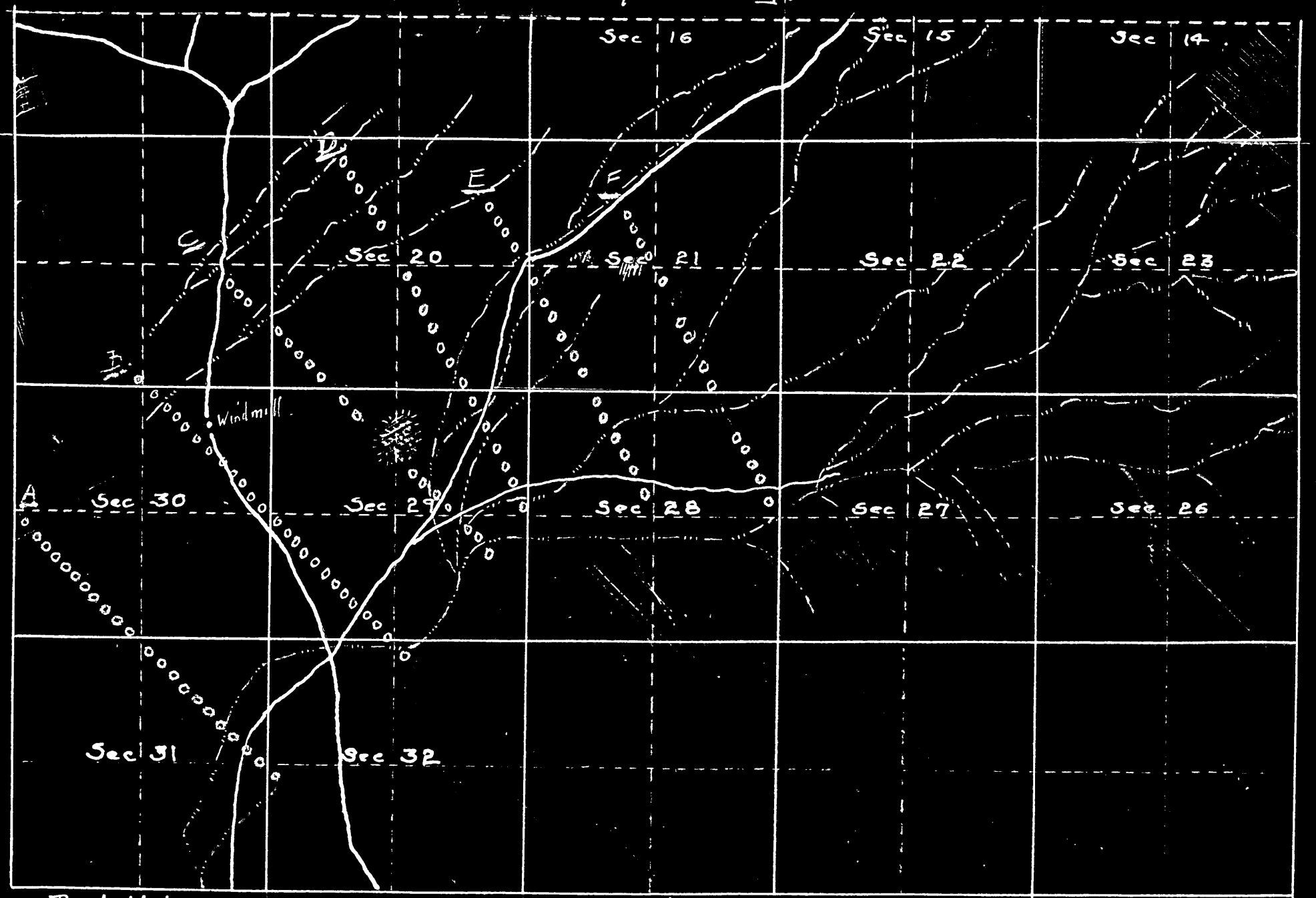
Drainage channels

Volcanic outcrop
Red shading

Black Magic Placer Claims
T 4 North Range 9 West
Maricopa County, Arizona



Black Magic Placer Claims
T 4 North Range 9 West
Maricopa County, Arizona



Test Holes

Trails

Drainage channels

Volcanic outcrop

dmca 2880

1880

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS
EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(PMGC)